



BENCHMARKS

The Computing Center NewsJournal
University of North Texas

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Everything You Wanted to Know About FTP, and More

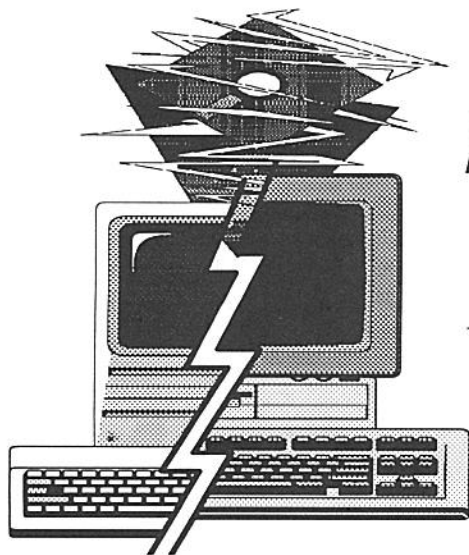
By Claudia Lynch, *Benchmarks* Editor (as04@unt.edu)

The theme of this issue is the result of a request from several of our readers. (See what happens when you ask for something?) They wanted the topic of "electronic data transfer" addressed in a single issue, so that they could refer to it for guidance in the future. I hope this is what they were looking for.

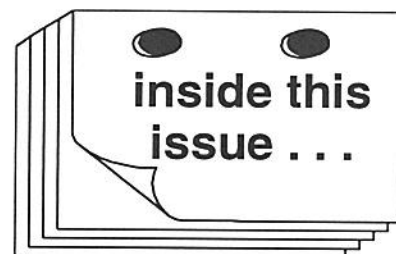
Several of the articles in this issue are updated versions of previous articles, the rest are new or have never been printed in *Benchmarks*. Not surprisingly, FTP — file transfer protocol — emerges as a major topic of discussion.

FTP "allows a person to transfer files between two computers, generally connected via the Internet."¹ Many computer systems connected to the Internet allow you to access files on their systems without actually having an account on those computers. This is done via a facility known as *Anonymous FTP*. An Anonymous FTP site allows you to look around and retrieve (but does not usually let you store) files on their system. See the article on page 3 and the "ClipTip" on page 30 for more information about Anonymous FTP. See the rest of this issue for many more exciting articles on various aspects of electronic data transfer and other topics of interest. If you have a request for topics to be covered in future issues, let us hear from you. ■

¹ Anonymous FTP Frequently Asked Questions (FAQ) List ©1994, Perry Rovers. This FAQ is available at multiple locations across the Internet, including *news.answers* on USENET.



Electronic
Data
Transfer



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 2400 - 14,400 BAUD: (817) 565-3989
 300 - 9600 BAUD: (817) 565-3461 HST protocol ONLY
 2400 - 14,400 BAUD: D/FW METRO 792-4140

Area code 214 must dial 817 before the METRO #, see note to the right.

Note: Dialing 1 before the area code will result in a long-distance charge. Set Data Bits to 8, No Parity, Stop Bits to 1 except on the 3461 line and when CALLing VM3270, where Data Bits are set to 7, Parity to S, and Stop Bits to 1. When dialing in, the autobaud feature requires you to hit the <RETURN>-key repeatedly after the connection is made so that the receiving modem can determine the baud rate. When you see the prompt (# for local numbers, UNTMODEMS> for the metro lines) you can enter one of the following commands to connect with the system of your choice.

ACS Host Systems	Local Phone Lines (# prompt)		METRO LINES (UNTMODEMS> prompt)	INTERNET (CUTCP, NCSA)
	SYTEK/HST Lines (3461)	Other lines (3300, 3989) Type SHOWD for list of hosts.		
Academic Mainframe (CMS, Academic COM-LETE)	CALL 3270	CALL VM3270	CONNECT VM3270 or VM3271, VM3272, VM3273	tn3270 vm.acs.unt.edu -OR- telnet vm3270.acs.unt.edu
VAX (VMS)	CALL DEC	CALL DEC	CONNECT DEC	telnet vaxb.acs.unt.edu
Sol (UNIX)	CALL 900	CALL SOL	CONNECT SOL	telnet sol.acs.unt.edu
Jove (UNIX)	Inaccessible	CALL JOVE	CONNECT JOVE	telnet jove.acs.unt.edu
Gopher [dedicated Gopher Server]	Inaccessible	CALL GOPHER	CONNECT GOPHER	telnet gopher.unt.edu
Departmental Systems				
Ponder (Computer Sciences Sequent)	CALL 780	CALL PONDER	CONNECT PONDER	telnet ponder.csci.unt.edu
UNT Libraries' on-line card catalog	CALL 3000	CALL LIBRARY	CONNECT LIBRARY	telnet library.unt.edu

To exit from the local phone lines, press <ESCAPE><RETURN>, type DONE (at the # prompt), press <RETURN><RETURN>. To exit from the metro lines, press <CTRL-SHIFT-6>, type DISCONNECT (at the UNTMODEMS> prompt), press <RETURN>. Exiting from telnet or TN3270 is dependent upon the package. CUTCP uses <ALT-X>.

HOURS FOR UNIVERSITY OF NORTH TEXAS COMPUTER ACCESS AREAS : Summer 1994

Day of Week	Willis	BA	ISB 110	Chilton 255	Chilton 116	GAB 330, Wooten	Matthews	Music	GAB 550, Terrill	ISB 205C	ISB I/O Area (138A)	Lab Locations
Monday-Thursday	Open 24 hrs.	8 am-MN	7:30 am-10 pm	8 am-10 pm	10 am-10 pm	8 am-MN	8 am-6 pm	8 am-10 pm	8 am-8 pm	10 am-8 pm	Open 24 hrs.	☉ BA: 334, 335 ☉ Chilton: 255, 116 [Adaptive Lab] ☉ GAB: 330, 550 ☉ ISB: 110, 205C — graduate students only ☉ Matthews: 309 ☉ Music: 1007 ☉ Terrill: 220 ☉ Willis: 134 ☉ Wooten: 120
Friday	Open 24 hrs.	8 am-8 pm	7:30 am-9 pm	8 am-3 pm	10 am-3 pm	8 am-3 pm	8 am-5 pm	8 am-3 pm	8 am-3 pm	10 am-5 pm	Open 24 hrs.	
Saturday	Open 24 hrs.	8 am-8 pm	9 am-9 pm	10 am-5 pm	Closed	Closed	10 am-5 pm	Closed	Closed	10 am-5 pm	Open 24 hrs.	
Sunday	Open 24 hrs.	Noon-MN	1 pm-10 pm	Closed	1-10 pm	2 pm-MN	1-10 pm	1-8 pm	Closed	1-8 pm	Noon-MN	

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Defining Our Terms: May/June 1994

The following terms are found in this issue of Benchmarks, including this glossary. These definitions are taken from the "Internet Users' Glossary" (Request for Comments: 1392, January 1993) produced by the User Glossary Working Group of the User Services Area of the Internet Engineering Task Force (IETF).

802.x — The set of IEEE standards for the definition of LAN protocols. See also: IEEE.

address — There are three types of addresses in common use within the Internet. They are email address; IP, internet or Internet address; and hardware or MAC address. See also: email address, IP address, internet address, MAC address.

American National Standards Institute (ANSI) — This organization is responsible for approving U.S. standards in many areas, including computers and communications. Standards approved by this organization are often called ANSI standards (e.g., ANSI C is the version of the C language approved by ANSI).

American Standard Code for Information Interchange (ASCII) — A standard character-to-number encoding widely used in the computer industry. See also: EBCDIC.

Anonymous FTP — Anonymous FTP allows a user to retrieve documents, files, programs, and other archived data from anywhere on the Internet without having to establish a userid and password. By using the special userid of "anonymous" the network user will bypass local security checks and will have access to publicly accessible files on the remote system. See also: archive site, File Transfer Protocol.

ANSI — See: American National Standards Institute

application — A program that performs a function directly for a user. FTP, mail, and Telnet clients are examples of network applications.

archie — A system to automatically gather, index, and serve information on the Internet. The initial implementation of

Please see Glossary on page 4.

The (Somewhat Less Than) Definitive Guide to FTP

By Douglas J. Bateman, Computing Center Support Assistant (dbateman@unt.edu)

The Internet is a magnificent repository of files, documents, programs, photographs and other graphic images, journals, and even entire books. Navigation tools such as Gopher, Hytelnet, and Mosaic provide one means of accessing the Internet archives, but sometimes you may want a more direct route. This is where FTP (File Transfer Protocol) excels.

I will be taking the perspective of users of DOS-based PCs for the purpose of this article. This is not necessarily reflective of any bias I have toward any particular environment. It is a simple statement of fact that Macintosh users enjoy the luxury of very easy-to-use tools. We are just now beginning to see similar tools for Microsoft Windows-based PCs. I refer Macintosh users to the terrific program, Fetch, for FTP use on campus. Connecting from off campus? Well, you'll just have to read on with the rest of us.

What it is—How it's used

Stated simply, FTP is one way that files can be transferred from one computer to another, usually via the Internet. There is another very useful and often under-utilized aspect of FTP which I will describe at the end of this article. For now I will be discussing the use of FTP for transferring files from a computer at a remote site to a UNT host system (Jove, Sol, VAX, CMS). This is by far the most common use of FTP.

Before you can use FTP, you must be connected to a system that supports FTP; all of the UNT host systems do. After logging in to your account as you normally would, you begin FTP (on all systems except CMS) by simply typing: `ftp <system-name>`, where `<system-name>` is the name or address of the site to which you want to connect. If you are using your CMS account, before issuing the FTP command you must first initiate a TCP/IP session by entering `tcPIP`.

The system name should be in the form of either the domain name of the remote computer, e.g. `ftp.cs.colorado.edu`, or the Internet address, e.g. `128.138.243.151`—either form is acceptable. This procedure is also applicable if you are using an IBM PC-compatible that is connected to a campus LAN; e.g. all PCs in General Access Labs.

Once you have initiated an FTP session, your prompt will change to `ftp>` and you'll receive a message to the effect that you are now connected to the remote computer. Also, the remote computer will prompt you for a "Login" name. If you have ever heard of the phrase "Anonymous FTP", this is its origin because unless you know otherwise, you login as "anonymous". This is actually a misnomer because it is not truly anonymous; most systems are automatically notified of who you are when you FTP to them. Use the "anonymous" login unless you have specific instructions to login as someone/something else.

Next, the remote computer will prompt you for a password. Don't despair! Internet etiquette (netiquette) dictates that you simply enter your personal electronic mail address here, e.g. `dbateman@unt.edu` is what I would enter as my password. From this point on, you only need to know a handful of the many FTP commands available.

FTP Commands

The most commonly used commands are listed below. There is always a possibility that the commands might be different for the remote system to which you are connected, but you can always type **help** to determine all of the valid commands for a particular system. Common commands include:

- ❑ **ascii** — Sets transfer mode to text (ascii). This is useful for transferring text files, particularly if you are working from a PC. Text files vary slightly in format from system to system, but this mode will automatically convert them. Warning: if you transfer a binary file with this mode, the file will most likely be useless to you. Since ascii mode is the default, this is a common mistake.
- ❑ **bget [filename]** — Get (i.e. download) a file in binary mode. This is useful if you intend to transfer just one file. It does not change the current mode so if you were in ascii mode before issuing this command, you will be in ascii mode when the transfer is completed.
- ❑ **binary** — Sets transfer mode to binary. Can be used to transfer text files, but no translation will take place from the text format of the remote system to that of your local system. Must be used for binary file transfer.
- ❑ **bput [filename]** — Put (i.e. upload) a file in binary mode. Works similar to the bget command except in the reverse direction.
- ❑ **bye** — Closes the connection to the remote computer and exits the FTP program.
- ❑ **cd [directory-path]** — Change directory. This command enables you to navigate the directory structure of the remote computer to which you are connected. It works very much like the DOS cd command.
- ❑ **close** — “Disconnects” from the remote system but keeps you in the FTP session. Useful if you need to connect to several FTP sites, one after the other.
- ❑ **dir [directory-path]** — List files in current working directory or the specified directory. Quite often, files are listed in the UNIX long “style”. For those of you not accustomed to seeing this, here are a couple of examples:

```
-r-xr-r-   ftp 125,264 Dec 13 21:15 foo.bar
dr-xr-xr-x  ftp    512 Apr 17 1992 utility
```

Note that the “d” in the first position of the second line identifies this as a directory!

- ❑ **get [remote-filename] [local-filename]** — Get a file using current transfer mode. Remote-filename is the name of the file on the remote computer and must be located in the current working directory of the remote system. Local-filename is an optional means for you to rename the file at the same time you are transferring it. The file will be placed in the directory from which you began your FTP session. Case oftentimes is significant, so use whatever combination of lowercase and capital letters you noticed in the directory listing.
- ❑ **hash** — Very useful for providing visual feedback during a long file transfer. Prints a hash mark(#) on the screen for every 1,024 bytes transferred.
- ❑ **mget [filespec]** — Get multiple files using current transfer mode. Wild card characters can be used in the filespec and all files that match the filespec will be transferred.
- ❑ **mput [filespec]** — Put multiple files using current transfer mode. Again, wild card characters can be used in the filespec.

Please see FTP on page 5.

Glossary, continued from page 3.

archie provided an indexed directory of filenames from all Anonymous FTP archives on the Internet. Later versions provide other collections of information. See also: archive site, Gopher, Prospero, Wide Area Information Servers.

archive site — A machine that provides access to a collection of files across the Internet. An “Anonymous FTP archive site,” for example, provides access to this material via the FTP protocol. See also: Anonymous FTP, archie, Gopher, Prospero, Wide Area Information Servers.

ASCII — See: American Standard Code for Information Interchange

bang path — A series of machine names used to direct electronic mail from one user to another, typically by specifying an explicit UUCP path through which the mail is to be routed. See also: E-mail address, mail path, UNIX-to-UNIX CoPy.

BITNET — An academic computer network that provides interactive electronic mail and file transfer services, using a store-and-forward protocol, based on IBM Network Job Entry protocols. BITNET-II encapsulates the BITNET protocol within IP packets and depends on the Internet to route them.

Campus Wide Information System

(CWIS) — A CWIS makes information and services publicly available on campus via kiosks, and makes interactive computing available via kiosks, interactive computing systems and campus networks. Services routinely include directory information, calendars, bulletin boards, databases.

CERT — See: Computer Emergency Response Team

client — A computer system or process that requests a service of another computer system or process. A workstation requesting the contents of a file from a file server is a client of the file server. See also: client-server model, server.

client-server model — A common way to describe the paradigm of many network protocols. Examples include the name-server/name-resolver relationship in DNS and the file-server/file-client relationship in NFS. See also: client, server, Domain Name System, Network File System.

Computer Emergency Response Team

(CERT) — The CERT was formed by DARPA in November 1988 in response to the needs exhibited during the Internet worm incident. The CERT charter is to work with the Internet community to facilitate its response to computer security events involving Internet hosts, to

take proactive steps to raise the community's awareness of computer security issues, and to conduct research targeted at improving the security of existing systems. CERT products and services include 24-hour technical assistance for responding to computer security incidents, product vulnerability assistance, technical documents, and tutorials. In addition, the team maintains a number of mailing lists (including one for CERT Advisories), and provides an anonymous FTP server, at cert.org, where security-related documents and tools are archived. The CERT may be reached by E-mail at cert@cert.org and by telephone at +1-412-268-7090 (24-hour hotline). See also: Defense Advanced Research Projects Agency, worm.

connection-oriented — The data communication method in which communication proceeds through three well-defined phases: connection establishment, data transfer, connection release. TCP is a connection-oriented protocol. See also: Connectionless, packet switching, Transmission Control Protocol.

connectionless — The data communication method in which communication occurs between hosts with no previous setup. Packets between two hosts may take different routes, as each is independent of the other. UDP is a connectionless protocol. See also: Connection oriented, packet switching, User Datagram Protocol.

Corporation for Research and Educational Networking (CREN) — This organization was formed in October 1989, when BITNET and CSNET (Computer + Science NETwork) were combined under one administrative authority. CSNET is no longer operational, but CREN still runs BITNET. See also: BITNET.

datagram — A self-contained, independent entity of data carrying sufficient information to be routed from the source to the destination computer without reliance on earlier exchanges between this source and destination computer and the transporting network. See also: frame, packet.

Defense Advanced Research Projects Agency (DARPA) — An agency of the U.S. Department of Defense responsible for the development of new technology for use by the military. DARPA (formerly known as ARPA) was responsible for funding much of the development of the Internet we know today, including the Berkeley version of UNIX and TCP/IP.

Please see Glossary on page 9.

FTP, continued from page 4.

- ❑ **open [system-name]** — Used to connect to the specified system when you are at the ftp prompt. The complement of **close**.
- ❑ **put [filename]** — Transfer a file from your local system to the remote system using the current transfer mode.

Using FTP, In Brief

Following is a brief summary of the steps involved in using FTP. If you remember each step you shouldn't have any trouble transferring files across the Internet.

- ❶ Identify the remote system to which you want to connect.
- ❷ Connect to your Jove, Sol, VAX, or CMS account. You may ignore this step if you are connecting from a PC attached to an on-campus LAN.
- ❸ FTP to the remote system.
- ❹ Log in to the remote system.
- ❺ Navigate to the directory that contains the file(s) you want.
- ❻ Set the file transfer mode to binary, if you are getting binary files.
- ❼ Issue the appropriate **get** command.
- ❽ Say goodbye.

A transcript from a sample FTP session

```
SunOS UNIX (jove)

login: dbateman
Password:
Last login: Mon Apr 18 14:01:42 from helpdesk3.nms.un
OS/MP 4.1B Export (Jove/root)#9: Tue Mar 15 09:39:38 1994

Terminal type is vt100
~ % ftp ftp.microsoft.com
Connected to gowinnt.microsoft.com.
220 gowinnt Windows NT FTP Server (Version 1.0).
Name (ftp.microsoft.com:dbateman): anonymous
331 Anonymous access allowed, send identity (e-mail name) as
password.
Password:
230-1
| Welcome to ftp.microsoft.com (a.k.a gowinnt.microsoft.com)!
|
| Please enter your "full e-mail name" as your password.
| Report any problems to csftpad@microsoft.com
|
| Refer to the readme.txt file for further information
230 Anonymous user logged in as anonymous.
ftp> dir
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
dr-xr-xr-x 1 owner group 0 Apr 6 14:35 Advsys
dr-xr-xr-x 1 owner group 0 Apr 6 16:44 DESKAPPS
-r-xr-xr-x 1 owner group 2411 Mar 25 20:43 README.TXT
dr-xr-xr-x 1 owner group 0 Apr 12 15:57 Softlib
226 Transfer complete.
737 bytes received in 6 seconds (0.12 Kbytes/s)
```

```
ftp> cd DESKAPPS
250-Welcome to the Microsoft Internet Support Server. This machine offers the following materials and information for systems and network products:
```

- Selected knowledge-base articles
- Selected product fixes
- Updated drivers
- Utilities
- Documentation

The Desktop Applications directory is maintained by Microsoft's Desktop Applications Support group. Products represented here are all of Microsoft's Desktop applications.

This machine is not on the Microsoft corporate network and contains no confidential information.

```
For further information refer to the readme.txt file.
250 CWD command successful.
ftp dir
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
dr-xr-xr-x  1 owner  group      0 Sep 23  1993 ACCESS
dr-xr-xr-x  1 owner  group      0 Mar 18  11:48 WORD
dr-xr-xr-x  1 owner  group      0 Sep 24  1993 WORDART
dr-xr-xr-x  1 owner  group      0 Feb  8  18:12 WORKS
226 Transfer complete.
1098 bytes received in 0.32 seconds (3.4 Kbytes/s)
ftp cd WORD
250-
```

Please note that the Word60a.exe patch in this area is for the US English version of Word for Windows ONLY.

```
250 CWD command successful.
ftp dir
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
-r-xr-xr-x  1 owner  group      735546 Mar 10 16:44
AUS60A.EXE
-r-xr-xr-x  1 owner  group      242 Mar 18 11:42 index.txt
dr-xr-xr-x  1 owner  group      0 Apr 17 18:34 KB
-r-xr-xr-x  1 owner  group      754975 Feb 17 15:08
WORD60A.EXE
226 Transfer complete.
535 bytes received in 0.41 seconds (1.3 Kbytes/s)
ftp get index.txt
200 PORT command successful.
150 Opening ASCII mode data connection for index.txt.
226 Transfer complete.
local: index.txt remote: index.txt
242 bytes received in 0.07 seconds (3.4 Kbytes/s)
ftp bye
221 Goodbye.
~ % logout
```

The other side of FTP

Now for the really good news, as I hinted at the beginning of this article. The fact that you can FTP from an on-campus PC that is connected to a LAN offers you the capability of an extremely convenient means of transferring files from a PC to or from your host system account on Jove, Sol, VAX, or CMS. This capability is

provided by FTP client software that is available on virtually all of the LANs on campus, including the General Access Labs (GALs).

A common scenario

You've spent a long night at your home PC connected to your UNT host system account. Using Gopher, you have finally located the documents that will add just the right finishing touch to your research paper. You tell Gopher to transfer the files to your host system account, but you just don't have the energy left to wait while using Kermit to transfer the files to your home PC. So, the next morning you visit your conveniently located GAL, FTP to your account, log in with your User-ID and password (not "anonymous"), and transfer the files there to a diskette. How convenient!

For CMS users, the good news is that this is an excellent way to transfer statistical data to and from your account. The bad news is that you have several extra steps to perform in order to make use of this capability. Please see "Transferring Files Using FTP," in *Introduction to the Conversational Monitor System (CMS)*, a handout available from the Computing Center, ISB 119.

FTP is a privilege

One caveat to keep firmly in mind regarding FTP: it is a privilege, not a right. The people, institutions, businesses, and organizations that offer anonymous FTP sites are doing so as a courtesy to all of us. The machines on which these sites are located are primarily for the conduct of whatever business the owners are engaged in; offering anonymous FTP service is a luxury that they could very easily remove. Netiquette demands that you do not FTP to sites during their regular business hours and that you remain connected for only the length of time it

takes to obtain the file or files in which you are interested. Abuses of privileges at a particular site have historically resulted in the loss of that site to everyone using the Internet.

Keeping the rules of netiquette in mind, you have a wealth of archives to research. Everything from children's games to the latest scientific research is at your disposal. Enjoy. ■

Now That I Have It, What Do I Do With It?

By Douglas J. Bateman, Computing Center Support Assistant (dbateman@unt.edu)

Most of the files that you find at FTP sites are modified in some way from their original form. In their existing form, the files are pretty much useless to you; i.e., documents can't be read, programs can't be executed, photographs can't be viewed; Special programs are used to modify the original file or files for the sole purpose of convenience or efficiency in transferring them from one computer system to another electronically.

Most often, this modification results in a compressed file so that it uses less storage space on the source site and takes less time to transfer to your local site. Additionally, you will often find a file that is actually a container for several files, generally referred to as a file archive. There are programs that will compress several files and combine them into an archive under one file name. In some cases, you will even find files encoded in a manner that makes them easier for electronic mail systems to handle. In all of these cases, you will need a similar special utility program in

order to make use of the files you have transferred.

Fortunately, there has been some informal standardization in the naming of files on FTP sites. A suffix is added to the file name that enables you to determine what type of file it is and what utility program you will need in order to undo whatever operation was done on it; e.g. if it was compressed, to uncompress it. The following table illustrates some of the suffixes currently in use:

File type	Example	Principle Program(s)	FTP transfer mode
DOS executable	foo.exe	none needed	binary
	foo.com		
compressed archive, DOS & Unix (most popular DOS compression form)	foo.zip	pkunzip (DOS) unzip (Unix)	binary
DOS compressed archive (alternate forms)	foo.arc	arc or arce	binary
	foo.lha	lha	
	foo.lhz	lharc	
	foo.arj	unarj	
Unix compressed (GNU format)	foo.z	gunzip	binary
	foo.gz		
Unix compressed (standard format)	foo.Z	uncompress	binary
Unix archive	foo.tar	tar, pax	binary
Unix compressed archive (GNU format)	foo.tar.z	gunzip + tar or zcat	binary
	foo.tgz		
Unix compressed archive (standard format)	foo.tar.Z	gunzip + tar or zcat	binary
Macintosh compressed archive	foo.sit	StuffIt	binary
Macintosh compressed archive	foo.cpt	Compactor	binary
Macintosh binary encoded	foo.hqx	BinHex	ascii or binary
Generic binary encoded	foo.uue	uudecode	ascii or binary
Text file or document	foo.txt	any text editor or word processor	ascii or binary
	foo.doc		
Postscript file (normally intended only for printing)	foo.ps	ghostview (ghostscript viewer)	ascii or binary

Note: Graphics files are compressed using one of the listed methods or specialized graphics programs. Specialized viewer programs are often needed to view them. An example of a common format is JPEG which requires a JPEG viewer. ■

Requesting Internet FTP Files Via E-mail

By Claudia Lynch, *Benchmarks* Editor (as04@unt.edu)

Much of the following text was posted by Amer Neely (amer.neely@onlinesys.com) to the newsgroup alt.bbs.internet on 3/12/94. It has been expanded and edited for publication in Benchmarks.

Digital Equipment Corporation (DEC) has set up a mail server to handle FTP requests. The server is located at `ftpmail@decwrl.dec.com`, but it is so busy that you may have better luck sending the message to `ftpmail@sunsite.unc.edu` or `ftpmail@ftp.uu.net`. All three servers provide the same services and the latter two will probably provide faster results.

You can get a list of commands to use when requesting files from the mail servers by sending a message to one of the three servers listed above with the word **help** in the body of the message. You will receive a message back containing all the necessary commands to FTP files via E-mail.

Some pointers

- A subject heading is not required but it's helpful later on when you start getting googols of messages back and don't know what to save them as.
- Files are sent back to you as E-mail messages (ASCII text) in 64K chunks and a large file may get broken up into a dozen or more chunks.
- Make the first line of the actual message a "reply" command. (See the example below.)
- If you requested a binary file it will be encoded using either uuencode or btoa, whichever you specify. UUENCODE is probably more available for DOS systems.
- Encoding is mandatory since binary files cannot (yet) be sent through E-mailers.

Example

Here's an example request for the file `FOOBAR.ZIP` at `some.site.place.org`. The file is in the directory `/pub/Unknown/New`.

```
To: ftpmail@sunsite.unc.edu
Subject: foobar.zip

reply your.name@your.site
connect some.site.place.org
chdir pub/Unknown/New
binary
uuencode
get FOOBAR.ZIP
quit
```

That's all there is to it. But note the exact case of each part of the requested file. Most ftp sites are UNIX-based and they are case-sensitive. It's VERY frustrating to get a reply back saying "file not found" when all you did was put a lowercase letter instead of an uppercase one. This applies to directory names as well.

Outcome

You will get an acknowledgement back saying that "your ftpmail request has been received" and letting you know how many jobs there are in the queue ahead of yours. This could be in the thousands!!! You may not get the actual file/s if things are too clogged up. Give it about 4-5 days before requesting the file again. This acknowledgement will also tell you if the file was sent, how many parts were sent, and the size. Good info to know.

If all goes well you will get messages back with a subject of "results of your ftpmail request" or something similar. If you included a "Subject" in your original request, this will be seen in the first few lines of the header information. It will also tell you which part it is. You can use this to save the message to a file with a meaningful name. Then download everything to your PC and away you go.

The ftpmail program automatically names every uuencoded file "ftpmail.zip" (or whatever other extension the original file had), so when you uudecode the file/s you end up with a file called "ftpmail.zip". Before you run uudecode, you can edit this with an ASCII editor in the first .uue file and put in the name of the actual file if you like.

The nice thing about uuencode is that you don't have to strip out the header information from each file — just run the whole shebang through uudecode and it will work. You don't even have to patch all the files together into one big one. Just make sure that they are numbered sequentially as in: `fubar1.uue`, `fubar2.uue`, `fubar3.uue`, etc.

Other FTP Mail Servers

Similar services as those described above are supplied by: `bitftp@pucc.princeton.edu`, `bitftp@plearn.edu.pl`, `bitftp@vm.gmd.de`, and `trickle@hearn.nic.surfnet.nl`. Send a message to one of the sites with the word **help** in the body for more information. ■

Glossary, continued from page 5.

Defense Data Network (DDN) — A global communications network serving the US Department of Defense composed of MILNET, other portions of the Internet, and classified networks which are not part of the Internet. The DDN is used to connect military installations and is managed by the Defense Information Systems Agency. See also: Defense Information Systems Agency.

Defense Information Systems Agency (DISA) — Formerly called the Defense Communications Agency (DCA), this is the government agency responsible for managing the DDN portion of the Internet, including the MILNET. Currently, DISA administers the DDN, and supports the user assistance services of the DDN NIC. See also: Defense Data Network.

dialup — A temporary, as opposed to dedicated, connection between machines established over a standard phone line.

Domain Name System (DNS) — The DNS is a general purpose distributed, replicated, data query service. The principal use is the lookup of host IP addresses based on host names. The style of host names now used in the Internet is called "domain name", because they are the style of names used to look up anything in the DNS. Some important domains are: .COM (commercial), .EDU (educational), .NET (network operations), .GOV (U.S. government), and .MIL (U.S. military). Most countries also have a domain. For example, .US (United States), .UK (United Kingdom), .AU (Australia). See also: Fully Qualified Domain Name.

dot address (dotted decimal notation) — Dot address refers to the common notation for IP addresses of the form A.B.C.D; where each letter represents, in decimal, one byte of a four byte IP address. See also: IP address.

EARN — See: European Academic and Research Network

EBCDIC — See: Extended Binary Coded Decimal Interchange Code

Electronic Mail (E-mail) — A system whereby a computer user can exchange messages with other computer users (or groups of users) via a communications network. Electronic mail is one of the most popular uses of the Internet.

E-mail address — The domain-based or UUCP address that is used to send electronic mail to a specified destination. For example an editor's address is "as04@unt.edu". See also: bang path, mail path, UNIX-to-UNIX CoPy.

Please see Glossary on page 12.

FTP File Transfers and CMS

By Dr. Philip Baczewski, Assistant Director of Academic Computing Services (ac12@unt.edu)

TCP/IP on the VM/CMS system makes file transfers to and from CMS easily and quickly accomplished from any computer on the campus network. You can use an FTP program to connect directly to CMS and get and put files. Often it is easier, however, to log on to CMS and initiate an FTP session back to your point of origin. PC users on campus can use the FTP program included with the CUTCP package. Macintosh users can use Fetch to retrieve files from CMS.

Using FTP From a Remote System to Transfer CMS Files

Those using a system which supports an FTP program will be able to connect to their CMS User-ID and accomplish high-speed file transfers to and from CMS. The command to invoke FTP is: **ftp vm.acs.unt.edu or ftp 129.120.1.3**

Once a connection has been successfully made, you will be prompted with:

Username: **<User-ID>**

You should type your User-ID.

The system will respond with:

331 Send password please.
Password: **<password>**

You should then type your CMS logon password. The next prompt is:

332-ID00 logged in; no working directory defined
332 to access ID00 191, send 'ACCOUNT minidisk-password'
Account: **<mini-disk password>**

At this point you need to type your appropriate CMS minidisk password. Each minidisk has a *read* password for read-only access and a *write* password for read/write access. For most people, both will be the same as the original six-digit password that was assigned when the User-ID was created.¹ **Note that if you logged off of CMS using the GONE or DISC commands, you will only be able to connect in read-only mode and will need to enter your read password. You must be totally logged off of your CMS User-ID to connect with ftp in read/write mode. If you have entered a correct password, the system will respond with a message similar to the following:**

230 Working directory is ID00 191 (ReadOnly)

At this point you may perform a number of FTP commands. Some of the commands you may use are:

dir to see a directory of the CMS minidisk

get <filename.filetype> to transfer a file from CMS

put <filename.filetype> to transfer a file to CMS (read/write mode only)

¹ If you are unsure of what your minidisk passwords are, log on to your CMS User-ID and enter the command **DIRM MDPW**.

mget *.* to transfer multiple files from CMS, where * acts as a wild card character. It may also follow a string to allow you to transfer several files with similar names.

mput *.* to transfer multiple files to CMS (see above)

Notice that when you are specifying CMS files in FTP, the filename and the filetype must be separated by a period. Consult the documentation on whatever FTP program you are using for more information on FTP commands.

Using ftp to Transfer Files from CMS to a Remote System

When you are logged on to CMS, you can use the FTP command to transfer files to remote systems, including your PC, if you are running CUTCP Telnet or TN3270. To gain access to the ftp program you must first type TCPIP. To initiate an FTP file transfer from CMS type:

ftp<remote IP address>

You will then usually be prompted to enter your User-ID on the remote system, followed by your corresponding password. You may then use the following commands:

dir to see a directory listing of the remote system

get <filename.filetype> to transfer a file to CMS

put <filename.filetype> to transfer a file from CMS

mget *.* to transfer multiple files to CMS, where * acts as a wild card character. It may also follow a string to allow you to transfer several files with similar names.

mput *.* to transfer multiple files from CMS (see above)

Notice again that when you are specifying CMS files in ftp, the filename and the filetype must be separated by a period. For more information on the ftp commands available, type **HELP ftp MENU** on CMS. For more information or help on VM TCP/IP, contact Academic Computing Services (565- 2324, ISB 119).

Using ftp with CUTCP

When you connect to CMS using CUTCP TN3270, it is easy to initiate an FTP session to your PC. You will first need to type TCPIP to gain access to the FTP command. You can then press **[ALT][T]** to generate an ftp command. You will see the following message appear on your screen:

```
VM TCP/IP FTP V2R1
Connecting to 129.120.nn.n, port 21
220 PC Resident FTP 2.2TN/TC-EI server, ready
USER (identify yourself to the host):
```

At this point you can type any value for "USER" and press **[ENTER]**. The next message you will see is similar to the following:

```
331 Password required.
Password:
```

At this point, press **[ALT][W]** and CUTCP will generate an internal password to verify that the incoming FTP session is associated with your outgoing terminal (TN3270) session. At this point, you will see the following message and can begin entering FTP commands at the Command prompt:

```
230 User logged in
Command:
```

Using Fetch to Retrieve Files From CMS

When using Fetch on the Macintosh, you can specify the CMS Internet address (vm.acs.unt.edu), and your CMS User-ID and password in the "Open Connection" dialog box. Be sure to leave the "Directory:" box blank. After selecting "OK", Fetch will prompt you for an additional password. At this point, you should type your CMS 191 minidisk password (as described above), and select "OK". You can now get and put files to and from your CMS User-ID. ■

TCP/IP Stats

From Investor's Business Daily (4/27/94 A6) as reported in E-d-u-p-a-g-e (4/28/94)

An analyst at International Data Corp. predicts, "By the end of 1992, 6.7% of all PCs on local area networks were using TCP/IP, but by the end of 1993 that was up to 9.4%. By the end of 1994, we estimate it will be over 14%." ■

Using the Kermit File Transfer Program on UNT Host Systems

By Bahram Paiani, CMS Documentation and Training Assistant (Bahram@cc1.unt.edu)

*This article originally appeared in the September 1992 issue of **Benchmarks**, page 13. It has been edited slightly for reprinting.*

Most of us here on the UNT campus use TCP/IP to transfer files back and forth between the mainframe or a minicomputer and our PC. But if you are using a modem to connect your PC to the academic mainframe (HDS 8083) or a minicomputer (VAX, Sol, Jove, etc.) system on campus and you want to transfer files, then you should know how to use the Kermit file transfer facility. Most host computers here at UNT support Kermit.

What follows is the basic knowledge you need to use Kermit easily and effectively. In order to transfer files between two points, both sides (the PC side and the other side) must use a common protocol (set of rules). We divide our discussion into two parts; the first part is for those who use Procomm Plus to connect to a host system and the second part is for those who use MS-Kermit to communicate with a host system.

We use the CMS host system as an example here, but the process is basically the same on any other host on the UNT campus.

If You're Using Procomm Plus ...

- **Sending file(s):** Suppose you are logged on CMS and you want to send a CMS file to your PC. Type **KERMIT** at the CMS Ready prompt. You will get a message like:

```
Kermit-CMS Version 4.2.6 XA (93/07/18)
Enter HINTS to get started

Kermit-CMS>
```

Type **SEND filename filetype filemode** and hit **[ENTER]**. You will see the following:

```
Kermit-CMS ready to send.
Please escape to local kermit now to RECEIVE the file(s).
```

This basically means that in order for Kermit-CMS to establish a file transfer process, it needs to *talk* to your communication program (in this case Procomm Plus) using Kermit protocol which fortunately Procomm Plus supports.

Hit the **[PAGE DOWN]** key on your PC keyboard. You get a menu asking you to enter the protocol number you are using; choose the number 2 option and hit **[ENTER]**. If everything goes well you will get a menu that shows the file transfer process in action. After the sending process is completed, Procomm Plus automatically returns you to your host Kermit prompt.

- **Receiving file(s):** To receive a file onto your CMS system, type **RECEIVE** at the Kermit prompt and hit the **[ENTER]** key. Now, to let your local communication program (Procomm Plus) know that you are expecting it to send a file to your CMS machine, you need to hit the **[PAGE DOWN]** key on your PC keyboard. PROCOMM will prompt you with a small window; type the file name and its path and hit **[ENTER]**. As soon as you hit the **[ENTER]** key, the file transfer begins and you get a menu displaying the process. You will be put back at your host Kermit prompt after the receive process is completed.

If You're Using MS-Kermit...

- **Sending file(s):** Type **SEND filename filetype filemode** at the CMS Kermit prompt and hit **[ENTER]**. Press **[ALT][X]** (hold down the **[ALT]** key and at the same time press **[X]**). Now type **RECEIVE** at the MS-Kermit prompt to start the process. After the sending process is terminated, you can get back to your host Kermit command line by typing **Connect** at the MS-Kermit prompt.
- **Receiving file(s):** Type **RECEIVE** at your CMS Kermit prompt and hit **[ENTER]**. Press **[ALT][X]** to go to the MS-Kermit prompt and type **SEND** followed with the complete file name and file path. As in sending files, after the file transfer is finished, type **CONNECT** to get back to your CMS Kermit prompt.

To transfer multiple files you can use wild card characters (i.e., * or %) as explained in your CMS and MS-DOS documentation. For further information, please call Academic Computing Services at 565-2324 or come by ISB Room 119. ■

Glossary, continued from page 9.

encapsulation — The technique used by layered protocols in which a layer adds header information to the protocol data unit (PDU) from the layer above. As an example, in Internet terminology, a packet would contain a header from the physical layer, followed by a header from the network layer (IP), followed by a header from the transport layer (TCP), followed by the application protocol data.

encryption — Encryption is the manipulation of a packet's data in order to prevent any but the intended recipient from reading that data. There are many types of data encryption, and they are the basis of network security.

Ethernet — A 10-Mb/s standard for LANs, initially developed by Xerox, and later refined by Digital, Intel and Xerox (DIX). All hosts are connected to a coaxial cable where they contend for network access using a Carrier Sense Multiple Access with Collision Detection (CSMA/CD) paradigm. See also: 802.x, Local Area Network.

European Academic and Research Network (EARN) — A network connecting European academic and research institutions with electronic mail and file transfer services using the BITNET protocol. See also: BITNET

Extended Binary Coded Decimal Interchange Code (EBCDIC) — A standard character-to-number encoding used primarily by IBM computer systems. See also: ASCII.

FAQ — Frequently Asked Question

file transfer — The copying of a file from one computer to another over a computer network. See also: File Transfer Protocol, Kermit.

File Transfer Protocol (FTP) — A protocol which allows a user on one host to access, and transfer files to and from, another host over a network. Also, FTP is usually the name of the program the user invokes to execute the protocol. See also: anonymous FTP.

For Your Information (FYI) — A subseries of RFCs that are not technical standards or descriptions of protocols. FYIs convey general information about topics related to TCP/IP or the Internet. See also: Request For Comments, STD.

frame — A frame is a datalink layer "packet" which contains the header and trailer information required by the physical medium. That is, network layer packets are encapsulated to become frames. See also: datagram, encapsulation, packet.

Sending SPSS and SAS System Files Over the Internet

By Dr. Panu Sittiwong, Research and Statistical Support Manager (panu@unt.edu)

This article appeared in the March/April 1994 issue of Benchmarks and is reprinted here mostly to make this issue on electronic data transfer truly comprehensive. The last paragraph, however, has been added since the article was first published.

The extensive availability of the Internet network and its speed in transferring files from one site to another makes it possible to send data files over the network. Raw data files can be sent easily without much preparation. System specific data files such as those that were created by SAS and SPSS require some preprocessing before they can be sent. This article will outline the steps that are required if you want to send those datasets through the Internet.

Since both SAS and SPSS system data files were created to be used only on the same operating system on which they were created, they are not useful on other systems. In order to move these datasets to another operating system, you will need to copy the data into a transport or export format. The export format data file contains instructions — which are understood by all computer operating systems — on how to create the attached data file into the system file for that particular operating system.

At UNT, SAS software is available for DOS, Windows, OS/2, UNIX, CMS, and the OS/MVS operating environments. The following programs show the SAS statements that will create an export data format.

SAS/PC

```
Libname PORT SASV5XPT 'd:\filename.ext';
```

```
Libname SASPCFIL 'd:\path';
Proc Copy in=SASPCFIL out=PORT;
  Select filename;
```

*d:\filename.ext is a DOS filename including Drive name and directory name;
*d:\path is a drivename and directory name;

*filename is a DOS filename which contains a SAS dataset that you want to copy to export format;

SAS for UNIX, Windows, and OS/2.

```
Libname PORT XPORT 'd:\filename.ext';
```

```
Libname SASPCFIL 'd:\path';
```

```
Proc Copy in=SASPCFIL out=PORT;
  Select filename;
```

*d:\filename.ext is a filename including Drive name and directory name;
*d:\path is a directory name;

*filename is a DOS filename which contains the SAS dataset that you want to copy to export format;

SAS for MVS

```
//idnnSAS JOB (idnn,2,10,9999),'Your Name',PASSWORD=mvssp
/*JOBPARM CARDS=99999
// EXEC SAS
//PORT DD SYSOUT=B
Libname SASFILE 'USER.idnn.xxxxxxxx' UNIT=SYSDA VOL=SER=ACADnn
DISP=SHR;
Libname PORT XPORT;
Proc Copy in=SASFILE out=PORT;
  Select name
```

Please see Glossary on page 13.

Where: USER.idnn.xxxxxxxx is MVS Dataset name.
ACADnn is a DASD volume name.
name is a SAS member name.

After the job is done, you can copy the export file to your minidisk from the J2 Browse screen.

SAS for CMS

```
Libname PORT XPORT 'filename filetype filemode';  
Libname SASFILE 'A';  
Proc copy in=SASFILE out=PORT;  
select name;
```

SPSS/PC+

```
Get file = 'd:\filename.ext'.  
Export outfile = 'd:\filename.ext'.  
*d:\path is a drive name and a directory name;
```

Where:d:\filename.ext is a DOS filename including drive name and directory name.

SPSS for MVS

```
//idnnSAS JOB (idnn,2,10,9999),'Your Name',PASSWORD=mvssp  
/*JOBPARM CARDS=99999  
// EXEC SPSSX  
//SPSSFILE DD DSN=USER.idnn.xxxxxxxx,UNIT=SYSDA,  
VOL=SER=ACADnn,DISP=SHR  
//PORT DD SYSOUT=B  
Get file = SPSSFILE  
Export outfile = PORT
```

Where: USER.idnn.xxxxxxxx is an MVS Dataset name.
ACADnn is a DASD volume name.

SPSS for CMS

```
Get file = 'filename filetype *'.  
Export outfile = 'filename filetype filemode'.
```

Step-by-Step Process

- 1 Create and run the appropriate program above.
- 2 The program will create an export datafile. In PC, CMS, and UNIX environments, the file will be named whatever you specify. In the MVS environment, the file will be in punch format. You can copy this file from the J2 queue to your minidisk with the command **COPY filename filetype filemode**.
- 3 You can send this file on the Internet using any mail program. When using the CMS operating system, however, you must transfer this file using the **SENDFILE** command. This command must be issued after the **TCPIP** command.
- 4 You can transfer this file using the FTP program also. SPSS export files may be sent as a regular text file (ASCII mode). SAS export files, however, must be transferred using binary mode. To do this, type **BINARY F 80** below the **Get** or **Put** command. This will preserve the 80 column LRECL of the export file. ■

Glossary, continued from page 12.

FTP — See: File Transfer Protocol

Fully Qualified Domain Name (FQDN) —

The FQDN is the full name of a system, rather than just its hostname. For example, "venera" is a hostname and "venera.isi.edu" is an FQDN. See also: hostname, Domain Name System.

FYI — See: For Your Information

gateway — The term "router" is now used in place of the original definition of "gateway". Currently, a gateway is a communications device/program which passes data between networks having similar functions but dissimilar implementations. This should not be confused with a protocol converter. By this definition, a router is a layer 3 (network layer) gateway, and a mail gateway is a layer 7 (application layer) gateway. See also: mail gateway, router, protocol converter.

Gopher — A distributed information service that makes available hierarchical collections of information across the Internet. Gopher uses a simple protocol that allows a single Gopher client to access information from any accessible Gopher server, providing the user with a single "Gopher space" of information. Public domain versions of the client and server are available. See also:archie, archive site, Prospero, Wide Area Information Servers.

host — A computer that allows users to communicate with other host computers on a network. Individual users communicate by using application programs, such as electronic mail, Telnet and FTP.

hostname — The name given to a machine. See also: Fully Qualified Domain Name.

IEEE — Institute of Electrical and Electronics Engineers

International Organization for Standardization (ISO) — A voluntary, non-treaty organization founded in 1946 which is responsible for creating international standards in many areas, including computers and communications. Its members are the national standards organizations of the 89 member countries, including ANSI for the U.S. See also: American National Standards Institute, Open Systems Interconnection.

internet — While an internet is a network, the term "internet" is usually used to refer to a collection of networks interconnected with routers. See also: network.

Internet — (note the capital "I") The Internet is the largest internet in the world. Is a three level hierarchy composed of backbone networks (e.g., NSFNET, MILNET), mid-level

networks, and stub networks. The Internet is a multiprotocol internet. See also: backbone, mid-level network, stub network, transit network, Internet Protocol, Corporation for Research and Educational Networks, National Science Foundation.

internet address — A IP address that uniquely identifies a node on an internet. An Internet address (capital "I"), uniquely identifies a node on the Internet. See also: internet, Internet, IP address.

Internet Architecture Board (IAB) — The technical body that oversees the development of the Internet suite of protocols. It has two task forces: the IETF and the IRTF. "IAB" previously stood for Internet Activities Board. See also: Internet Engineering Task Force, Internet Research Task Force.

Internet Assigned Numbers Authority (IANA) — The central registry for various Internet protocol parameters, such as port, protocol and enterprise numbers, and options, codes and types. See also: STD.

Internet Engineering Task Force (IETF) — The IETF is a large, open community of network designers, operators, vendors, and researchers whose purpose is to coordinate the operation, management and evolution of the Internet, and to resolve short-range and mid-range protocol and architectural issues. It is a major source of proposals for protocol standards which are submitted to the IAB for final approval. The IETF meets three times a year and extensive minutes are included in the IETF Proceedings. See also: Internet, Internet Architecture Board.

Internet Protocol (IP) — The Internet Protocol, defined in STD 5, RFC 791, is the network layer for the TCP/IP Protocol Suite. It is a connectionless, best-effort packet switching protocol. See also: packet switching, Request For Comments, TCP/IP Protocol Suite.

Internet Research Task Force (IRTF) — The IRTF is chartered by the IAB to consider long-term Internet issues from a theoretical point of view. It has Research Groups, similar to IETF Working Groups, which are each tasked to discuss different research topics. Multi-cast audio/video conferencing and privacy enhanced mail are samples of IRTF output. See also: Internet Architecture Board, Internet Engineering Task Force.

IP address — The 32-bit address defined by the Internet Protocol in STD 5, RFC 791. It is usually represented in dotted

The Network Connection

By Dr. Philip Baczewski, Assistant Director, Academic Computing Services, and BITNET INFOREP (ac12@unt.edu).

This column is a continuing feature of Benchmarks intended to present news and information on various aspects of wide area networks.

Sending that Binary File

This is a revised version of a Network Connections column which appeared in the March 1993 issue of Benchmarks. Considering the theme of this month's issue, it seemed appropriate to revisit this topic and update some of the information.

If you actively use BITNET or the Internet to communicate with other professionals in your field, chances are you've either tried or needed to send a WordPerfect or executable program file over one of these networks. Maybe you've tried and gotten a message back like, "just what was that you sent me anyway?" If this situation sounds familiar, then you also may have discovered the distinction between a *binary* file and a *text* file.

A computer file is made up of a collection of *bytes* (eight-digit binary numbers) which can represent characters, numbers, or instructions for a computer's CPU. A WordPerfect document or an executable program file is commonly referred to as a *binary* file, a throwback term meaning a file containing bytes which don't represent printable characters. In a *binary* file which is an executable program, the bytes represent instructions to the computer's CPU. A *binary* file can also be a specially formatted data file. A WordPerfect file falls into the latter category, since it not only contains your printable text, but also contains formatting information in the form of unprintable byte codes. The bottom line? Since the standard methods of sending mail and files on BITNET and the Internet are designed to send printable text messages, sending a *binary* file is not always easy. But it's not impossible.

uuencode and uudecode

The most common method for sending a *binary* file over BITNET or the Internet is to use a program named *uuencode* to translate the "unprintable characters" into combinations of printable characters which can then be transmitted via normal means (i.e. MAIL or SENDFILE). The only catch is that the recipient of your message must have access to a program called *uudecode* in order to translate the file back to its useful *binary* format. Fortunately, these programs are commonly available for many different computer systems.

uuencode and *uudecode* originated in relation to a network called UUNet, a UUCP network (hence the "UU" names), for the same reasons that are outlined above. UUCP stands for "Unix to Unix Copy" and you will find *uuencode* and *uudecode* installed on most UNIX systems. The usefulness of these programs and the connection of various types of computers to UUCP networks led to the development of versions of the programs for VAX/VMS, PC, Macintosh, Amiga, and other computers. At the end of this article is a list of Anonymous FTP sources for PC and Macintosh versions of these programs.¹

¹For a quick guide to Anonymous FTP, see the *Clip Tip* on page 30.

Please see Glossary on page 17.

Using the Programs

uuencode and uudecode programs are usually very easy to use. If you are using a PC on the UNT campus, you might want to acquire the version of these that's available for anonymous ftp at ftp.unt.edu in the /pub/micro/ibm/utility directory. The filename **uuencodec.arc** is an archive file containing PC versions of uuencode and uudecode and the C source code for them. (You will need the arc program to extract them from the archive, using the command **arc -x uuencodec**). You can use these programs as follows:

- ☐ To encode a file:

```
uuencode      filename.ext
newname.ext
```

- ☐ To decode a file:

```
uudecode filename.ext
```

(On other systems, consult the available on-line documentation for the exact command syntax.)

Since encoding a file will usually increase its size, it is a good idea to process large files with an archiving program that supports file compression. Some examples are arc, zip, pkzip, lharc, and zoo. Once again, if you use such a program you must be sure that the recipient has access to the same program. Fortunately, these programs too are either freeware or shareware and are usually easy to acquire.

So, if you are coauthor of an article with a colleague across the country and you wish to exchange the WordPerfect version via Internet or BITNET mail, you might use the following sequence of commands:

- ☐ **pkzip article article.wp** — creates a file called **article.zip** which contains a compressed version of your WordPerfect file.
- ☐ **uuencode article.zip > article.zuu** — creates an encoded file that can be mailed over BITNET or the In-

ternet (BITNET users can also use SENDFILE).

If you received such a file you would use the following commands to convert it back to a format that is understandable to WordPerfect:

- ☐ **uudecode article.zuu** — decodes the file and creates a binary file (in this example, an archive file).
- ☐ **pkunzip article** — extracts the WP file from the archive.²

Binhex and Stuffit

The Macintosh, being an intrinsically different microcomputer, supports some different programs which perform the same function as uuencode, and pkzip. A version of uuencode does exist for the Macintosh, however, you will more commonly find Macintosh files which have been encoded using Binhex. Binhex (versions 4 and below) functions similarly to uuencode in converting a binary file to printable characters. Binhex files usually have an extension of ".hqx." A program call Stuffit is a file archive and compression utility. (Some versions of Stuffit can also decode Binhex files.) Stuffit files usually have the extension ".sit." Another file compression program is Compact Pro. All of these programs are shareware and can be acquired via Anonymous FTP.

Pegasus Mail and Mime

Those who use Pegasus mail for their communication on BITNET or the Internet can take advantage of that program's capabilities to encode and sometimes decode binary files. When using Pegasus mail for DOS to send a message, pressing <F7> brings up the file attachment dialog box. This box allows you to specify the name of your

file, optionally define the type of file, and optionally specify the type of encoding. If you have a WordPerfect or .ZIP file you wish to send, you can input that file name, and then select an appropriate file type (WordPerfect or Binary in this case), and select uuencode as the encoding type. The recipient of your message will receive one mail message which is your mail text and a second mail message which is the uuencoded file. When you receive a uuencoded file in Pegasus mail, it can sometimes be recognized as such by the mail program and Pegasus will offer you the option of viewing it as is, or decoding it to a file on your disk.

Pegasus also supports encoding via the MIME (Multipurpose Internet Mail Extensions) standard. MIME allows the transmission of many types of binary resources, including images, sound, and movies. Like any standard, though, it is only useful if the recipient's mail program also supports MIME. Since many developers have accepted MIME, it will not be too long until it becomes possible to take full advantage of the standard. In the meantime, you can use Pegasus mail to receive MIME mail messages as well as send them if you know that it can be received and MIME decoded on the other end.

Summing it all Up

Sending binary files over wide area networks may involve a little extra work on your part, but the end result in saved work and time may be well worth it. Eventually, mail programs will probably include standard compression and encoding features so that the above steps won't be necessary. Currently by default, Pegasus mail encodes any mail message attachments which are binary files; however, the recipient still either needs to be also using Pegasus mail, or needs access to a uudecode program. The emerging MIME standard may be the solution which eventually enables different mail programs to automatically encode and decode binary attach-

² For more information on acquiring PKZIP, see the article "New PKZIP Released" in the January/February 1993 issue of *Benchmarks* (v. 14, no. 1, p. 18).

ments without any intervention on your part.³

Some Sources

- ☐ **PC MS-DOS:** uuencode/uudecode and PKZIP

Host : ftp.unt.edu

Location: /pub/micro/ibm/utility

File name:

- uuencode.arc
- pkz204g.exe (self extracting archive)

- ☐ **Macintosh:** Stuffit and Compact Pro (local source)

Host: ftp.unt.edu

Location: /pub/micro/mac

File names:

- compact-pro-132.hqx
- stuffit16.sit

- ☐ **Macintosh:** Binhex, Stuffit, and uuencode/uudecode

Host: wuarchive.wustl.edu

Location: /systems/mac/info-mac/util

File names:

- binhex-40.hqx
- binhex-50.hqx
- binhex4.bin
- stuffit-converter-302.hqx
- stuffit-deluxe-304-updater.hqx
- stuffit-deluxe-305-updater.hqx
- stuffit-expander-301.bin
- stuffit-expander-301.hqx
- stuffit-frontier-303.hqx
- stuffit-lite-305.hqx
- stuffit-spacesaver-102-updater.hqx
- stuffit-spacesaver-103-updater.hqx
- stuffit-spacesaver-104-updater.hqx
- uu-lite-13.hqx
- uulite-14.hqx
- uutool-232.hqx

³ For more information see "MIME: Multimedia Across the Internet," *Benchmarks*, (October 1992, v. 13 no. 8, p. 9). ■

List of the Month

Each month we will highlight one BITNET, Internet, or USENET Special Interest Group (SIG) mailing list. This month's list...

RSI on majordomo@world.std.com

The RSI Network Newsletter is now available for automatic subscriptions/unsubscribing from world.std.com.

Owner: Craig O'Donnell (dadadata@world.std.com) Please use the Owner address to submit material to the Newsletter or ask a question. The RSI (Repetitive Stress Injury) Network Newsletter is produced and edited by Caroline Rose and edited for Internet publication by Craig O'Donnell.

The RSI Network Newsletter uses a moderated list, and it is for distribution only. You cannot post messages. The Newsletter is for people who suffer from keyboard-related injuries. It comes out every 2 months, direct to your email address. Please contact Craig if you would like to submit something to the RSI Network Newsletter (see below).

To subscribe: Send a mail message to **majordomo@world.std.com** The Subject heading doesn't matter. Put this into the body of your message just as it appears here: **subscribe rsi**

Help With Majordomo: Send a mail message to: **majordomo@world.std.com**. Send the message: **help** ■

Trojan Horse Not Just History

From *M-Link Newsbytes* (v.4, no.6)

Those of you who download software from the Internet, should be aware that there is a "trojan horse" type of software causing problems in PCs. According to NASA, a DOS program called "CD-IT.ZIP" claims to give read/write capability to CD-ROMS. What it really does is lock up your computer and force you to reformat your entire drive (meaning you lose much of your data) to make it go away. Remember, a little piece of software cannot make a CD-ROM writeable! The submitters of this trojan are still being sought. ■

Taking a Byte Out of RSI

From *E-d-u-p-a-g-e* (05/03/94)

Repetitive stress injuries are on the rise, and are estimated to cost U.S. businesses as much as \$20 billion a year. More than 60% of all workplace illnesses are attributable to RSI, and some of the most serious injuries come from using a mouse, says an expert on the subject. (Miami Herald 5/2/94 C1) Meanwhile, the computer industry is beginning to respond with a variety of "ergonomic" keyboards, designed to reduce RSI. The keyboards go for anywhere from \$179 to \$1,200. [*Investor's Business Daily* (5/3/94 A4)] ■

Electronic Data Transfer

Glossary, continued from page 14.

decimal notation. See also: dot address, internet address, Internet Protocol, network address, subnet address, host address.

Kermit — A popular file transfer protocol developed by Columbia University. Because Kermit runs in most operating environments, it provides an easy method of file transfer. Kermit is NOT the same as FTP. See also: File Transfer Protocol.

layer — Communication networks for computers may be organized as a set of more or less independent protocols, each in a different layer (also called level). The lowest layer governs direct host-to-host communication between the hardware at different hosts; the highest consists of user applications. Each layer builds on the layer beneath it. For each layer, programs at different hosts use protocols appropriate to the layer to communicate with each other. TCP/IP has five layers of protocols; OSI has seven. The advantages of different layers of protocols is that the methods of passing information from one layer to another are specified clearly as part of the protocol suite, and changes within a protocol layer are prevented from affecting the other layers. This greatly simplifies the task of designing and maintaining communication programs. See also: Open Systems Interconnection, TCP/IP Protocol Suite.

listserv — An automated mailing list distribution system originally designed for the BITNET/EARN network. See also: BITNET, European Academic Research Network, mailing list.

Local Area Network (LAN) — A data network intended to serve an area of only a few square kilometers or less. Because the network is known to cover only a small area, optimizations can be made in the network signal protocols that permit data rates up to 100Mb/s. See also: Ethernet, Fiber Distributed Data Interface, token ring, Wide Area Network.

MAC address — The hardware address of a device connected to a shared media. See also: Media Access Control, Ethernet.

mail exploder — Part of an electronic mail delivery system which allows a message to be delivered to a list of addresses. Mail exploders are used to implement mailing lists. Users send messages to a single address and the mail exploder takes care of delivery to the individual mailboxes in the list. See also: Electronic Mail, email address, mailing list.

mail gateway — A machine that connects two or more electronic mail systems (in-

cluding dissimilar mail systems) and transfers messages between them. Sometimes the mapping and translation can be quite complex, and it generally requires a store-and-forward scheme whereby the message is received from one system completely before it is transmitted to the next system, after suitable translations. See also: Electronic Mail.

mail path — A series of machine names used to direct electronic mail from one user to another. This system of email addressing has been used primarily in UUCP networks which are trying to eliminate its use altogether. See also: bang path, email address, UNIX-to-UNIXCoPy.

mail server — A software program that distributes files or information in response to requests sent via email. Internet examples include Almanac and netlib. Mail servers have also been used in Bitnet to provide FTP-like services. See also: Bitnet, Electronic Mail, FTP.

mailing list — A list of email addresses, used by a mail exploder, to forward messages to groups of people. Generally, a mailing list is used to discuss certain set of topics, and different mailing lists discuss different topics. A mailing list may be moderated. This means that messages sent to the list are actually sent to a moderator who determines whether or not to send the messages on to everyone else. Requests to subscribe to, or leave, a mailing list should ALWAYS be sent to the list's "request" address (e.g., ietf-request@cnri.reston.va.us for the IETF mailing list). See also: Electronic Mail, mail exploder.

Media Access Control (MAC) — The lower portion of the datalink layer. The MAC differs for various physical media. See also: MAC Address, Ethernet, Logical Link Control, token ring.

Metropolitan Area Network (MAN) — A data network intended to serve an area approximating that of a large city. Such networks are being implemented by innovative techniques, such as running fiber cables through subway tunnels. A popular example of a MAN is SMDS. See also: Local Area Network, Switched Multimegabit Data Service, Wide Area Network.

MIME — See: Multipurpose Internet Mail Extensions

moderator — A person, or small group of people, who manage moderated mailing lists and newsgroups. Moderators are responsible for determining which email submissions are passed on to list. See also: Electronic Mail, mailing list, Usenet.

Multipurpose Internet Mail Extensions (MIME) — An extension to Internet email which provides the ability to transfer non-textual data, such as graphics, audio and fax. See also: Electronic Mail.

National Science Foundation (NSF) — A U.S. government agency whose purpose is to promote the advancement of science. NSF funds science researchers, scientific projects, and infrastructure to improve the quality of scientific research. The NSFNET, funded by NSF, is an essential part of academic and research communications. It is a highspeed "network of networks" which is hierarchical in nature. At the highest level, it is a backbone network currently comprising 16 nodes connected to a 45Mb/s facility which spans the continental United States. Attached to that are mid-level networks and attached to the mid-levels are campus and local networks. NSFNET also has connections out of the U.S. to Canada, Mexico, Europe, and the Pacific Rim. The NSFNET is part of the Internet.

netiquette — A pun on "etiquette" referring to proper behavior on a network.

network — A computer network is a data communications system which interconnects computer systems at various different sites. A network may be composed of any combination of LANs, MANs or WANs. See also: Local Area Network, Metropolitan Area Network, Wide Area Network, internet.

network address — The network portion of an IP address. For a class A network, the network address is the first byte of the IP address. For a class B network, the network address is the first two bytes of the IP address. For a class C network, the network address is the first three bytes of the IP address. In each case, the remainder is the host address. In the Internet, assigned network addresses are globally unique. See also: Internet, IP address, host address.

Network File System (NFS) — A protocol developed by Sun Microsystems, and defined in RFC 1094, which allows a computer system to access files over a network as if they were on its local disks. This protocol has been incorporated in products by more than two hundred companies, and is now a de facto Internet standard.

Network News Transfer Protocol (NNTP) — A protocol, defined in RFC 977, for the distribution, inquiry, retrieval, and posting of news articles. See also: Usenet.

Open Systems Interconnection (OSI) — A suite of protocols, designed by ISO committees, to be the international standard computer network architecture. See also: International Organization for Standardization.

packet — The unit of data sent across a network. "Packet" is a generic term used to describe a unit of data at all levels of the protocol stack, but it is most correctly used to describe application data units. See also: datagram, frame.

packet switching — A communications paradigm in which packets (messages) are individually routed between hosts, with no previously established communication path. See also: circuit switching, connection-oriented, connectionless.

Prospero — A distributed filesystem which provides the user with the ability to create multiple views of a single collection of files distributed across the Internet. Prospero provides a file naming system, and file access is provided by existing access methods (e.g., anonymous FTP and NFS). The Prospero protocol is also used for communication between clients and servers in thearchie system. See also: anonymous FTP,archie,archive site,Gopher,Network File System, Wide Area Information Servers.

protocol — A formal description of message formats and the rules two computers must follow to exchange those messages. Protocols can describe low-level details of machine-to-machine interfaces (e.g., the order in which bits and bytes are sent across a wire) or high-level exchanges between allocation programs (e.g., the way in which two programs transfer a file across the Internet).

protocol converter — A device/program which translates between different protocols which serve similar functions (e.g., TCP and TP4).

Request For Comments (RFC) — The document series, begun in 1969, which describes the Internet suite of protocols and related experiments. Not all (in fact very few) RFCs describe Internet standards, but all Internet standards are written up as RFCs. See also: For Your Information, STD.

router — A device which forwards traffic between networks. The forwarding decision is based on network layer information and routing tables, often constructed by routing protocols. See also: gateway.

server — A provider of resources (e.g., file servers and name servers). See also: client, Domain Name System, Network File System.

Simple Mail Transfer Protocol (SMTP) — A protocol, defined in STD 10, RFC 821, used to transfer electronic mail between computers. It is a server to server protocol, so other protocols are used to access the messages. See also: Electronic Mail, Post Office Protocol.

Simple Network Management Protocol (SNMP) — The Internet standard protocol, defined in STD 15, RFC 1157, developed to manage nodes on an IP network. It is currently possible to manage wiring hubs, toasters, jukeboxes, etc.

STD — A subseries of RFCs that specify Internet standards. The official list of Internet standards is in STD 1. See also: For Your Information, Request For Comments.

TCP — See: Transmission Control Protocol

TCP/IP Protocol Suite — Transmission Control Protocol over Internet Protocol. This is a common shorthand which refers to the suite of transport and application protocols which runs over IP. See also: IP, TCP, UDP, FTP, Telnet, SMTP, SNMP.

TELENET — A public packet switched network using the CCITT X.25 protocols. It should not be confused with Telnet.

Telnet — Telnet is the Internet standard protocol for remote terminal connection service. It is defined in STD 8, RFC 854 and extended with options by many other RFCs.

Transmission Control Protocol (TCP) — An Internet Standard transport layer protocol defined in STD 7, RFC 793. It is connection-oriented and stream-oriented, as opposed to UDP. See also: connection-oriented, User Datagram Protocol.

Trojan Horse — A computer program which carries within itself a means to allow the creator of the program access to the system using it. See also: virus, worm.

UNIX-to-UNIX CoPy (UUCP) — This was initially a program run under the UNIX operating system that allowed one UNIX system to send files to another UNIX system via dial-up phone lines. Today, the term is more commonly used to describe the large international network which uses the UUCP protocol to pass news and electronic mail. See also: Electronic Mail, Usenet.

Usenet — A collection of thousands of topically named newsgroups, the computers which run the protocols, and the people who read and submit Usenet news. Not all Internet hosts subscribe to Usenet and not all Usenet hosts are on the Internet. See also: Network News Transfer Protocol, UNIX-to-UNIX CoPy.

User Datagram Protocol (UDP) — An Internet Standard transport layer protocol defined in STD 6, RFC 768. It is a connectionless protocol which adds a level of reliability and multiplexing to IP. See also: connectionless, Transmission Control Protocol.

UUCP — See: UNIX-to-UNIX CoPy

virus — A program which replicates itself on computer systems by incorporating itself into other programs which are shared among computer systems. See also: Trojan Horse, worm.

Wide Area Information Servers (WAIS) — A distributed information service which offers simple natural language input, indexed searching for fast retrieval, and a "relevance feedback" mechanism which allows the results of initial searches to influence future searches. Public domain implementations are available. See also:archie,Gopher,Prospero.

Wide Area Network (WAN) — A network, usually constructed with serial lines, which covers a large geographic area. See also: Local Area Network, Metropolitan Area Network.

World Wide Web (WWW or W3) — A hypertext-based, distributed information system created by researchers at CERN in Switzerland. Users may create, edit or browse hypertext documents. The clients and servers are freely available.

worm — A computer program which replicates itself and is self-propagating. Worms, as opposed to viruses, are meant to spawn in network environments. Network worms were first defined by Shoch & Hupp of Xerox in ACM Communications (March 1982). The Internet worm of November 1988 is perhaps the most famous; it successfully propagated itself on over 6,000 systems across the Internet. See also: Trojan Horse, virus.

WWW — See: World Wide Web ■

Popular FTP Sites Via Gopher

The University of Minnesota has set up a menu on their Gopher called "Popular FTP Sites via Gopher." Here's what they have to say about it [From Gopher Jewels — Wed, 6 Apr 94 (gopherjewels@einet.net) by David Riggins (david.riggins@tpoint.com)]:

Many computers on the Internet have collections of software and useful information that are available to the network community via programs that follow the File Transfer Protocol (FTP). Using FTP often seems a little arcane and unnecessarily complex to the novice. Well, Internet Gopher now does FTP. To you, it just looks and feels like so much more information accessible via Gopher.

Link Information: Type=1 Name=Popular FTP Sites via Gopher Path=1/FTP Searches/Popular FTP Sites via Gopher Host=gopher.tc.umn.edu Port=70 URL: gopher://gopher.tc.umn.edu:70/11/FTP Searches/Popular FTP Sites via Gopher ■



News From the CWIS/Gopher Hole

By Mark Thacker, CWIS Coordinator (thacker@unt.edu)

This column covers features and resources available through the University's Gopher Campus Wide Information System (CWIS). Gopher is available on various UNT host computers including the VAX, Sol, and Jove. It is also available in the General Access Labs and on various Novell file servers around campus.

Changes in Other Internet Gopher References

Many of you may appreciate the listings in the Gopher menu option "Gophers in this month's *Benchmarks*" and I will continue it, however I want to add something that will make our system even more useful for external references. Currently, the "Internet Information by Subject" menu is actually just a pointer to UT Dallas. Soon, I will carry all of this information locally so that we do not keep hitting UT Dallas every time we request something. This should mean slightly faster response for you and less load for UT Dallas.

I will also see if I can start carrying the *Gopher Jewels* listings of Gopher by subject matter locally as well. Many of you may know about this mailing list. It basically organizes new information available in Gopher by a rough subject category. They then make this information available on a Gopher server for people to use. I will attempt to carry the same information locally on our server. Yes, you will actually be connecting to each individual remote service when you select the menu item, but at least the pointers to them will be on our quick UNT Gopher server. I already do this with the "Other Gopher, Information Servers & Searches" menu item which is updated every week.

New Gophers Highlighted

Below is a brief note about a new Gopher server. Some of the information has been edited for brevity.

- **The NYU Medical Center Department of Anesthesiology** — would like to announce the GASNET Anesthesiology Gopher Server. This Gopher server offers text, files, and pictures of interest to anesthesiologists. It is the home of the archives of the Anesthesiology Discussion Group, and the new, on-line anesthesiology journal, "Educational Synopses in Anesthesiology and Critical Care." The system administrator is Keith J Ruskin, MD.
- **Association of Research Libraries** — Other net-surfers may already have found this, but I haven't seen any references to it. The Association of Research Libraries (Washington DC) has an interesting new gopher server with material of interest to library users of all kinds: gopher to arl.cni.org and see what you find.

What was most striking is an apparently brand new report (under "Scholarly Communication") from the Mellon Foundation in New York, laying out their view of the world of electronic scholarly publication and calling at the end for proposals from people who wish to get money from them for demonstration projects. The report itself is very interesting, and the prospect of Mellon support for these things is potentially important. Apparently they would welcome inquiries. (The short report appears side by side on the gopher with the much longer text of the book they did last year, *University Libraries and Scholarly Communication*, which is more or less a historical and analytical survey of all the issues involved, and is very interesting in its own right.) [Natalie (maynor@ra.msstate.edu)]

- **Management Center of Academic and Research Network of Greece** — ARIADNE, located at DEMOCRITOS research center. This server provides Internet access to the HELLENIC CIVILIZATION database (currently developing) and to other resources.

The HELLENIC CIVILIZATION database contains information of Ancient Greek Arts (Sculpture, building, Museum, etc) and literature. The database also contains a presentation of every Museum of Greece and Cyprus. [Dr. Athanasios Drigas, Operational Manager Of Ariadne Network (drigas@cyclades.nrcps.ariadne-t.gr)] [Lazaros Theodorou, Server Manager (ltheo@ithaki.servicenet.ariadne-t.gr)]

- **Total Quality Management** — A new server accessible from Mosaic and Gopher is now on-line with information on Total Quality Management. It is primarily a point of access to TQM files that have previously been available only by modem to the TQMBBS in Washington, DC. Most of the BBS files are here, and more will be added. Com-

General Information

ments to quality@eng.clemson.edu.

- ❑ **GOPHERN course 27 lessons** — Jim Gerland has kindly allowed me to archive his and Rich Smith's excellent GOPHERN course on the Oklahoma Geological Survey Observatory gopher. [From: jim@leonard.okgeosurvey1.gov (Jim Lawson)]
- ❑ **Biology Collection** — A nice biology collection at the University of Missouri-St. Louis Library Gopher. [From: david.riggins@tpoint.com]
- ❑ **Breast Cancer Information Clearinghouse** — You might want to add NYSERNet's Breast Cancer Information Clearinghouse under "Medical Related" Gopher Jewels. [From: tmdamon@nysernet.org (Terri Damon)]
- ❑ **Census Bureau** — In addition to news information and statistics, the site carries other information about the organization, policies, and statistical programs of the Census Bureau. For example, you will currently find:
 - government finances data
 - research papers from the Center for Economic Studies
 - statistical software from the International Statistical Programs Center
 - new product advisories from Data User Services
 - Statistical Briefs
 - The "We the American" series from the 1990 census
 - Software to extract data from the Survey of Income and Program Participation and the Current Population Survey
 - pointers to other Internet sites carrying census data.

For more information about the Census Bureau's Internet site, contact Jackson Morton in the Public Information Office at (301) 763-4040. Or you can E-mail to io@info.census.gov.

- ❑ **Butterworths Legal Publishers** — Another publisher on the net. This one focuses on legal. [From: david.riggins@tpoint.com]
- ❑ **Copyright Law** — The University of Virginia Library has an interesting collection on Copyright Law [From: david.riggins@tpoint.com]
- ❑ **Daily Federal Register** — Counterpoint Publications now has a gopher setup to access the Daily Federal Register. [From: Gleason Sackman(sackman@plains.nodak.edu)]
- ❑ **Earthwatch Radio Scripts (Sea Grant Institute and IES)** — Earthwatch Radio is a two-minute program on science and the environment sponsored by the Sea Grant Institute and the Institute for Environmental Studies (IES) at the University of Wisconsin-Madison. Staff and students at Sea Grant and IES research, write, edit and produce 10 Earthwatch programs every two weeks. The programs are copied onto cassette tapes and mailed to more than 150 commercial and non-commercial radio stations in the United States and Canada. The service is free, and the programs are broadcast at the discretion of station managers.

This listing contains (1) scripts of previously recorded Earthwatch Radio programs, and (2) letters sent with the cassette tapes that briefly describe each program. Earthwatch programs often use excerpts from tape-recorded interviews, and interview segments appear in paragraphs that are indented and begin and end with quotation marks. [From: david.riggins@tpoint.com]
- ❑ **Environmental Software** — The U.S. Environmental Protection Agency Region 5 and Purdue University have created 28 interactive environmental software programs for PCs which are now accessible on the Great Lakes National Program Office (GLNPO) gopher. These public domain programs contain numerous color graphics; many are hypertext based and are

accessible to a wide variety of audiences. [Karen Reshkin, USEPA Region 5, Voice: (312) 353-6353, FAX: (312) 353-4342, (reshkin.karen@epamail.epa.gov) (kmr@r5es.r05.epa.gov)]

- ❑ **Internet Town Hall** — This project is funded by a grant from the National Science Foundation to the New York University School of Business in conjunction with the Internet Multicasting Service. Additional support for this project has been provided by Sun Microsystems and UUNET Technologies. It will soon provide gateways into the SEC and Patent archives. [From: david.riggins@tpoint.com]
- ❑ **Cooperative State Research Service** — The Cooperative State Research Service (CSRS) is pleased to announce the availability of several of its programs and information through the Gopher System. This information is available through the Extension Service Gopher System. Purpose: To Advance Science and Technology in Support of Agriculture, Forestry, People and Communities.

CSRS currently has several pieces of information which can be accessed from the ESUSDA Gophers. There is a pointer to the Current Research Information System (CRIS) Database, The CSRS Professional Worker's Directory, and the latest information is the CSRS National Research Initiatives (NRI) Funded Research Abstracts for FY 1993.

The NRI funded research abstracts may be found by making the following selections from the ES Gopher main menu:
 "USDA and Other Federal Agency ..."
 "USDA Agency Info"
 "CSRS-NRI Funded Research..."
- ❑ **Disability and Rehabilitation Materials** — Nice collection of disability and rehabilitation materials at Univ of Wisconsin, Trace Re-

General Information

search and Development Center
[From:david.riggins@tpoint.com]

- ❑ **Safety Information** — The best collection on safety I've seen is at the site Safety Information Resources on the InterNet, Vermont
[From:david.riggins@tpoint.com]

- ❑ **Coalition for Public Information Gopher** — This is a coalition of information developers, providers, and educators, dedicated to ensuring public access to the evolving electronic information infrastructure in Canada. The Coalition will encourage the development of change strategies and institutional readiness and to provide the public education and awareness that is required to adapt to tomorrow's information technology paradigms. The Coalition will provide a mechanism for public input, debate, and education concerning the developing information highway. [From: Brad Smith (smithb@stu.admin.usfca.edu)]

- ❑ **Louisiana Tech Journalism** — After some maintenance, upgrading of software and testing, the Louisiana Tech Journalism gopher server is back in operation.

Here's what you'll find (among other things) when you get there.

- A collection of on-line college newspapers available via gopher.
- Research papers dealing with college student media. These are pa-

pers that have been presented at College Media Advisers conventions.

- Research papers dealing with high school journalism. These are papers that have been presented at AEJMC sessions.

I hope you will find the Louisiana Tech Journalism Server useful. If you have comments related to it, please contact me directly by E-mail. [Eddie Blick Internet: blick@vm.cc.latech.edu]

- ❑ **National Center for the Workplace** — The National Center for the Workplace will address the problems created by the convergence of broad economic, social, cultural, political and technological changes in the workplace. A variety of approaches, including interdisciplinary research, information sharing, and policy analysis and development, will be used. The Center will report to the Department of Labor's (DOL) newly established Office of the American Workplace headed by Marty Manley, Assistant Secretary of Labor, with Stephanie Swirsky as Project Officer.

- ❑ **U.S. Senate Gopher** — The Senate Committee on Rules and Administration and the Sergeant at Arms office have announced the availability of a gopher server that will allow Senate personnel and committee offices to make information available on the Internet. [From: Chris_Casey@kennedy.senate.gov]

- ❑ **U.N., Food and Agriculture Organization (FAO)** — The information in this gopher is selected from the archives of the FAO. The information is not meant to be comprehensive since the gopher is still "under construction." It is intended to demonstrate the potential of an Internet Gopher Server as a publication tool for FAO.

With time, it is expected that this area will be filled with more data which will be regularly maintained. Until then, please bear with us as the system is developed. If you have suggestions about the contents or organization of this gopher, please contact: Laurie Federgreen, FAO (Laurie.Federgreen@fao.org) ■

Future CWIS Directions

By Mark Thacker, CWIS Coordinator
(thacker@unt.edu)

The Internet and tools to access information stored on it change quite frequently, as many of you know. As these tools change, new ways of utilizing them on our campus are needed. The Campus Wide Information System is supposed to allow access to information on student/faculty/staff concerns easily and from multiple platforms. Whatever helps achieve this goal is a good thing. I have been pondering over the future of our CWIS and have some thoughts to share with you here. Note that none of this is official policy statements or such, but some ideas that I think are important and that I am working towards.

Gopher

Gopher has been doing quite well with over 112,000 transactions last month alone on the UNT Gopher server! There are also now more than 6,700 Gopher servers in the world with 25-75 being added weekly. I have distributed

University Program Council On-Line in Gopher

By Mark Thacker, CWIS Coordinator (thacker@unt.edu)

I recently added the University Program Council to the list of Gopher information providers. Working with David Meek of the UPC, we have set up an area that will house UPC event information, committee information, announcements, policies, movie lists and other popular items. I welcome the UPC aboard and look forward to their providing information for Gopher clients.

Submitting items to Gopher is easy. You can use E-mail to do so from any Internet-capable mail system. In fact, you can even automate the submission so that you don't have to learn a thing about E-mail to use it. If you would like to provide information to Gopher, please contact Mark Thacker, CWIS Coordinator at 817-565-2568. I am located in ISB 119 and can be reached via E-mail at Thacker@unt.edu or, for WordPerfect Office users, CC1:THACKER. ■

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clients for MS-DOS, MS-Windows, Macintosh, UNIX and VAX and all are in use throughout machines on campus. Several articles have appeared in the *NT Daily* concerning the Internet and Gopher, which have dramatically increased the number of people applying for accounts on both the ACS file server and the Jove UNIX host machine.

I have also recently attended GopherCon '94 at the University of Minnesota (see "GopherCon '94: A Gathering of Gophernauts" on page 23) where I came back convinced that Gopher is doing quite well and that it will still play an important role in our CWIS. There are many new pieces of information that can only be accessed using the native Gopher clients (i.e. not using the Gopher capabilities built into World Wide Web programs). Many gateways and privileged information (such as grade transcripts and class information) might be provided using the built-in forms capability of Gopher.

Gopher also has the unique advantage in that adding information to it is very easy to do without involving the CWIS Coordinator. For that reason alone, Gopher will continue to be a deposit site for information on our CWIS. Information can be added to Gopher via E-mail without the information provider having to run a dedicated Gopher server. Not too many other systems provide this capability. Gopher also makes accessing FTP archives faster than accessing through direct FTP.

USENet NEWS

Academic Computing has purchased a site license for the Trumpet NEWS reader for Windows. I will be distributing a NEWS client for Macintosh computers soon. Thus, we have NEWS clients available for MS-DOS, MS-Windows, Macintosh, UNIX and VAX. Many newgroups have been added for a total of about 2,400 total news groups.

USENET can be thought of as the electronic democracy in one sense. All information is free to everyone and eve-

ryone can view the discussions taking place in any of the 2,400 groups that we carry. Thus, it is truly a Campus Wide Information system. It is ideal for distribution of general information that requires feedback from people.

USENET NEWS has an interesting position as it can act as the true bulletin board of the CWIS. Already, one Computer Science class uses it to carry on conversations about class assignments and projects. The teacher contributes assignment data and answers questions from the students. I would love to see more uses of USENET in this fashion.

World Wide Web (WWW)

Mosaic. Everyone has heard of it and now it appears to have caught on in the commercial realm. But what is Mosaic and what is the World Wide Web? The World Wide Web is a hypertext based multimedia Internet tool much like Gopher is. In fact, if Gopher can be thought of as the index to a book, then the World Wide Web is the pages of that book. No one wants a book without an index or an index without pages. Mosaic is simply one of many World Wide Web clients much as PC Gopher or HGopher are Gopher clients.

WWW client strengths are that they allow access to documents through a variety of means including FTP, Telnet, TN3270, Gopher, and native WWW documents. Images and sounds along with formatted text all appear on screen. That is, as long as you have a Graphical User Interface (GUI) based machine such as MS-Windows, Macintosh or X-Window. DOS and UNIX users will see text but at least the location of the images is preserved and the general formatting of the document is the same.

However, the current crop of Mosaic clients, at least, tend to be buggy and are large resource hogs. For example, in MacMosaic, to retrieve a Gopher based directory that is 1 Meg in size takes **30 minutes** and requires over **3 MB** of memory for the directory listing alone.

The same directory on the TurboGopher Macintosh client takes only **13 seconds** and the directory only occupies **1 MB** of memory. (It is a 1 MB directory after all!) WWW clients are also not Gopher+ compliant. This means that many sites offering alternate views (for example WordPerfect, PostScript, and Text) for documents using Gopher+ methods will not really be usable by WWW users.

All this being said, I want to note that I intend to use WWW as a document delivery mechanism on our campus. I think that it has some great potential and has a good perception in the user community. Look for such things as interactive campus maps and such in the future. I will be providing a WWW server by the start of the Fall '94 semester.

Other Items

What can go onto our Campus Wide Information System? How can it be more useful to people? How do I let people know about it and how to use it?

These are all questions that I face daily. I really think that the CWIS should move towards a student centered system to take advantage of the fact that information can be made available 24 hours per day. Information is also available to people calling in from home using any microcomputer and modem. If the CWIS (Gopher and WWW especially) is used to assist students, then it is serving the primary customer of the services at UNT, and that is very important.

Also, I am working with several external organizations to bring more regional information on-line. Projects are currently underway with the Dallas Museum of Art (already providing a great deal of information and images), the City of Denton, and very soon, possibly the Ft. Worth Museum of Science and History, as well as the Ft. Worth City Zoo.

How do I let people know, and what information needs to be there? These

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are questions that I have ideas about, but certainly not all of the answers. I openly ask for your suggestions concerning this. I have even considered advertising the CWIS in the *NT Daily* just to raise people's knowledge about it. However, I would like for everyone reading this article to ask themselves "What can I provide to the UNT CWIS?" and then call me with all of your wonderful suggestions!

I think that our CWIS will have a great future as a suite of products providing a centralized access point to information about UNT. However, it is something that all of us have to work for and believe in. I for one am in for the long haul and see a bright future. ■

GopherCon 94: A Gathering of Gophernauts

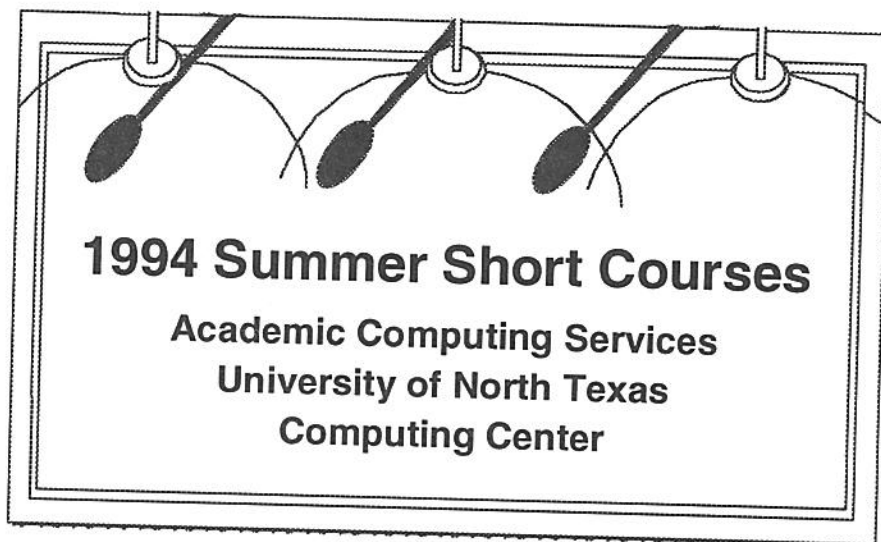
By Mark Thacker, CWIS Coordinator
(thacker@unt.edu)

The annual conference on the Internet Gopher system was held April 22-23, 1994 in Minneapolis, Minnesota at the University of Minnesota. I was one of the lucky 250 to attend and want to share some of my thoughts on the conference with you. I will basically report here about some of the more interesting topics and those projects that resulted from informal meetings between people.

Gopher Growth

The conference started with a presentation by the UMN Gopher team in which they reviewed Gopher's past and the current state of Gopher. They also had interesting statistics about the huge growth in Gopher traffic. At this time last year, the UMN Gopher team said that there were over 1,700 Gopher servers worldwide. This time around, due

Please see GopherCon on page 24.



- ❑ **Registration** — Academic Computing Services is offering the following short courses for the 1994 summer sessions. Please preregister to attend. You may either fill out the form attached to this document or register on-line via Gopher. If registering via Gopher, the form can be found in the path: UNT Departments, Schools, and Colleges /Computing Center /Short Courses. (Call 565-2324 if you have questions about Gopher.)
- ❑ **Eligibility and Class Size** — Faculty and students have first priority to register for these classes. A maximum of 10 people will be admitted to each of the courses held in ISB 110 and ISB 235. A maximum of 15 people will be admitted to each of the courses held in Chilton 255. *Academic Computing Services reserves the right to cancel any course that has 5 or fewer people registered 3 days before the course is scheduled.*
- ❑ **Hands-on Classes** — All persons registering for hands-on (ISB 110, Chilton 255) HDS, VAX and/or UNIX courses should have current User-IDs for the system to which the course applies. Applications for User-IDs are available in the Computing Center main office (ISB 119). It takes several working days for a User-ID to be activated.

HDS, VAX, and UNIX Courses

- ❶ **Introduction to CMS** — CMS is an interactive operating system employed by academic users to access the Academic HDS/8083 IBM-compatible mainframe computer at UNT. CMS users have access to a variety of programming languages, a sophisticated text editing system, and several statistical analysis packages. CMS users can also submit batch jobs to the OS/MVS system. **You must have a current CMS User-ID to take this class.**

Two two-hour sessions, the first to be held in the the Science Library (ACS General Access Lab, ISB 110), the second to be held in the Chilton General Access Lab (Chilton 255):

Date	Time	Instructor
Tuesday, June 14	2-4 p.m.	James Yarbrough
Monday, July 11	2-4 p.m.	Philip Baczewski

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- ② **Introduction to IBM MVS Job Control Language (JCL)** – This course provides an overview of IBM JCL for users who wish to further their knowledge in this area. It is useful for individuals who plan to run MVS batch jobs (e.g. SAS, SPSS-X) on the HDS IBM-compatible mainframe computer.

A two-hour session held in the Academic Computing Conference Room (ISB 235):

Date	Time	Instructor
Monday, June 13	2-4 p.m.	George Morrow

- ③ **Introduction to UNIX on Jove and Sol** – This course starts with a short discussion of the history and evolution of UNIX covering both the "Berkeley Software Distribution" and "AT&T System V" variants of UNIX. Topics covered will be the basic necessities for using UNIX and use of some of the various utilities available in UNIX. **You must have a current Sol or Jove User-ID to take this class.**

Two two-hour sessions, held in the Chilton General Access Lab (Chilton 255):

Date	Time	Instructor
Wednesday, June 22	2-4 p.m.	Staff
Tuesday, July 19	2-4 p.m.	Staff

- ④ **Introduction to UNIX for VAX Users** – This course is recommended for individuals who are familiar with VAX/VMS and want to learn how to get around on a UNIX system.

Two two-hour sessions, the first to be held in the the Science Library (ACS General Access Lab, ISB 110), the second to be held in the Chilton General Access Lab (Chilton 255):

Date	Time	Instructor
Thursday, June 16	2-4 p.m.	Staff
Tuesday, July 26	2-4 p.m.	Staff

Statistical Package Courses

- ① **Introduction to SAS** – This course is recommended for individuals who plan to incorporate statistical analyses into their research. The basic concepts of the SAS system are covered in this course. **This course or prior knowledge of SAS is a prerequisite for all other SAS courses.**

Two two-hour sessions, held in the Academic Computing Conference Room (ISB 235):

Date	Time	Instructor
Monday, June 20	2-4 p.m.	Roger Speas
Thursday, July 21	1-3 p.m.	Panu Sittiwong

GopherCon. continued from page 23.

to slightly better counting methods and explosive growth, there are now over 6,700 Gopher servers worldwide. Gopher is also growing at about a 20 percent per month rate. Last month alone, over 500 billion bytes of Gopher data were transmitted across the National Science Foundation Network (NSFNet) backbone of the Internet. However, the UMN Gopher team estimates that these figures are only half of the total Gopher data since some traffic was not attributed to Gopher. One word about this growth: "Wow."

Billy Barron of UT Dallas and myself were the only two people (to my knowledge) that were actually given a personal tour of "Gopher Central," the main UMN Computing Services area, by Paul Linder, author of the UNIX Gopher client and server. UMN now has six Macintosh IIci machines mirrored and linked together acting as their Gopher server; last year they only had to use two! All of these are running Apple's A/UX UNIX operating system and receive over 300,000 transactions per day! To give you an idea of scale, UNT achieves over 112,000 transactions per month.

The UMN team certainly has enough computer equipment. Within one closet, we saw six Mac IIci's, six NeXT workstations, a Sun MicroSparc workstation, several small Macintosh SE's and many gigabytes of disk drive storage. Every UMN Gopher team member seemed to have at least three workstations (normally Mac, NeXT and IBM-PC compatible) crammed into their very tiny cubicles. However, I will gladly say that UNT's climate control system and machine environment seems much cleaner and better than theirs.

Future Gophers

One of the things the UMN team was excited about was a 3-D virtual reality interface to Gopher. They have been working together with representatives

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from Apple Computer on designing a new interface in which menu items become 3-D objects. The objects are arranged in a circular, Stonehenge-like fashion with spiral variations to represent search results. The UMN team is thinking that a minimum processor of a Intel Pentium or IBM PowerPC (as found in Apple's PowerMacintosh and IBM's RS/6000 series) will be needed to work in this environment.

This new interface offers some exciting possibilities for Gopher. As you look at these objects, their shape, color, size, texture and location could give you important information about the Gopher object. For example, an item that is located someplace else on the Internet could be physically further away from you. Items that are popular could have slightly worn edges to them or perhaps lots of footprints nearby indicating that people often travel to this document. Old documents could literally look yellowed and old. A brief example of the contents of the document could be given on the front of the object.

One other project the Gopher team promised was support of OpenDoc in Gopher clients. OpenDoc is a component architecture that allows many vendors to make small specialized applications that perform small functions, such as charting, text entry, graphics, sorting, mini-spreadsheets, etc. In an OpenDoc environment, you work on a document, not inside of one particular application, and you might get OpenDoc tools or other components from anywhere on the network. When you need a graphics tool, you simply use it, even if it was written by another vendor. You don't have large monolithic programs like MS-Word or MS-Works. Gopher will probably fit into this as a network access tool. OpenDoc was developed by Apple, but Novell, IBM and WordPerfect are also developing OS/2, DOS, Windows, and Netware 4.x OpenDoc clients. There were indications that a Microsoft OLE

Please see GopherCon on page 26.

- ② **Introduction to SAS for CMS, DOS & UNIX** – This course is recommended for individuals who plan to use SAS on the academic HDS IBM-compatible mainframe, DOS or Sol. Topics covered include creating SAS programs, reading data into SAS programs, saving SAS datasets, importing/exporting SAS datasets to and from other SAS systems, and preparing and submitting SAS jobs to OS/MVS. SAS is used interactively in this course. **Prior knowledge of the SAS command language or attendance in the Intro. to SAS course is required.**

Two two-hour sessions will be held in the Chilton General Access Lab (Chilton 255):

Date	Time	Instructor
Tuesday, June 21	2-4 p.m.	Roger Speas
Monday, July 25	2-4 p.m.	Panu Sittiwong

- ③ **Introduction to SAS on Windows, OS/2, and X-Window** – This course is recommended for individuals who plan to use SAS on a GUI interface. Topics covered include creating SAS programs, reading data into SAS programs, saving SAS datasets, and importing/exporting SAS datasets to and from other SAS systems. This class will also utilize the SAS menus under the X Window System. **Prior knowledge of the SAS command language or attendance in the Intro. to SAS course is required.**

Two two-hour sessions will be held in the Science Library (ACS General Access Lab, ISB 110):

Date	Time	Instructor
Thursday, June 23	2-4 p.m.	Roger Speas
Wednesday, July 27	2-4 p.m.	Roger Speas

- ④ **Introduction to SPSS** – This course is recommended for individuals who plan to incorporate statistical analyses into their research and want to use SPSS on the academic HDS IBM-compatible mainframe. It emphasizes using SPSS from the CMS operating system. Topics covered include creating SPSS programs, reading data into SPSS programs, saving SPSS datasets on a minidisk, importing/exporting SPSS datasets to and from other SPSS systems, and preparing and submitting SPSS jobs to OS/MVS. SPSS is used interactively in this course. **You must have a current CMS User-ID to take this class.**

Two three-hour sessions to be held in the Science Library (ACS General Access Lab, ISB 110):

Date	Time	Instructor
Wednesday, June 15	1-4 p.m.	James Yarbrough
Wednesday, July 20	1-4 p.m.	James Yarbrough

- ⑤ **Introduction to SPSS PC +** — This course covers the basics of using SPSS PC+, Version 4.0.1, for IBM and compatible PCs. Topics covered include using the menu and help interfaces in REVIEW, loading files, selecting variables and running statistical analyses. Emphasis will be placed on building files for execution interactively.

Two two-hour sessions, held in the Science Library (ACS General Access Lab, ISB 110):

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Date	Time	Instructor
Monday, June 27	2-4 p.m.	James Yarbrough
Thursday, July 28	2-4 p.m.	James Yarbrough

- ⑥ **Introduction to SPSS on Windows** – This course is recommended for individuals who plan to use SPSS on a PC using Windows.

Two two-hour sessions will be held in the Chilton General Access Lab (Chilton 255):

Date	Time	Instructor
Wednesday, June 29	2-4 p.m.	Panu Sittiwong
Thursday, August 4	1-3 p.m.	Panu Sittiwong

Wide Area Network & Information Systems Courses

- ① **Introduction to Electronic Mail and Discussion Groups on CMS** – This course will cover the basics of using CMS MAIL to send and receive electronic mail to both the Internet and BITNET. The use of electronic mailing lists including BITNET LISTSERV will also be discussed. **Prior knowledge of CMS is required.**

A two-hour session, held in the Academic Computing Conference Room (ISB 235):

Date	Time	Instructor
Tuesday, June 28	2-4 p.m.	Philip Baczewski

- ② **Introduction to Electronic Mail and Discussion Groups on UNIX** - This course will cover the basics of using elm or pine to send and receive electronic mail to both the Internet and BITNET. The use of electronic mailing lists including BITNET LISTSERV will be discussed. Using USENET newsgroups via the nn News program on UNIX will also be explored. **Prior knowledge of UNIX is required.**

A two-hour session, held in the Academic Computing Conference Room (ISB 235):

Date	Time	Instructor
Thursday, June 30	2-4 p.m.	Staff

- ③ **Introduction to Internet Tools and Techniques** - The Internet is a collection of related computer networks that links almost a million computers throughout the world. This course will cover file transfer, remote login, use of on-line library catalogs at other universities, Archie, Gopher, and many other Internet topics *except* electronic mail and USENET News. **Prior knowledge of at least one of the following interactive operating systems is required: CMS, UNIX, MS-DOS.**

A one and one half-hour session, held in the Computing Center Conference Room (ISB 235):

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compatible Gopher client would also be written. OLE is similar to, but less powerful than, OpenDoc and is backed by Microsoft Corp.

You can also expect a PowerMacintosh native version of TurboGopher soon. The UMN team wouldn't give any release dates on these possible future Gopher products. However, I expect to see more products over the next year.

Searching Gopherspace and the Internet

You can also expect to see easier ways of searching the sea of Internet information soon. The developer of Veronica (Steve Foster) detailed how much the use of Veronica has grown and how it is starting to suffer under its own success. Several ideas were mentioned as to how to reduce the over 1 Gigabyte worth of data that Veronica keeps indexes on (it takes three days just to collect the menu items for all of Gopherspace!!!). Billy Barron of UT Dallas (formerly VAX/UNIX System Manager here at UNT), myself, and several other people are working on ways to reduce the size of the indexes that Veronica keeps. You can also expect the listing of separate Veronica servers to disappear and be replaced with a single menu item "Search Gopherspace using Veronica." This menu item will conduct a search for you on whatever Veronica servers are available. You won't care where it gets the final results from, just as long as you get the results! Expect something within the next few months.

The author and president of the company that distributes the "archie" (yes, with a lowercase "a") program (Peter Deutsch, Bunyip Systems) also detailed how his company will be collecting Gopher information soon. However, he will only collect from Gopher servers that specifically ask him to. This is the opposite philosophy from Veronica, which collects your information unless you tell it not to. Soon, there will be a Gopher-based archie-like

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service to search Gopherspace. The main advantage toarchie is its distributed nature — it already conducts searches without you having to know where the information is coming from. Again, expect something in the next couple of months.

One of the very useful items discussed was a new project spearheaded by Princess Riddle of Rice University. He is working with some librarians at his University to develop a system of indexing the information available on the Internet. Ideally, this project would be carried on a continuing basis by volunteer librarians on the Internet from other institutions. This index could be delivered to people in a variety of fashions including thearchie delivery system mentioned above. Everything is in planning stages now, but expect some work over the next few months.

Interactive Images in Gopher

Much of the fuss over the use of World Wide Web clients is their ability to display graphics that have links in them within the client itself. Alan Steremberg of the University of Michigan showed a Macintosh Gopher client sporting something called Interactive Image Format files. He proposed an extension to the Gopher+ client protocol that would allow Gopher clients to download and view GIFs that had links or hot-spots embedded in them. When the user selects one of these spots, a new Gopher item is retrieved. So, if you have a map of the U.S. and choose a particular state, your Gopher client retrieves another Gopher item that could be yet another graphic image (of perhaps the weather in that area), or could be a file describing that state.

The Gopher team seemed particularly excited about this proposal, probably for two reasons:

- ① Interactive images can make Gopher more useful and less tied to the menu-based system for information.

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Date	Time	Instructor
Tuesday, July 5	2:30-4 p.m.	Staff

- ④ **Introduction to Gopher, a campus-wide information system** - This course will cover the basics of using Gopher, from various hosts and microcomputers on campus, to access a vast array of information about UNT, other universities, and the world.

A one and one-half-hour session, held in the Academic Computing Conference Room (ISB 235):

Date	Time	Instructor
Thursday, July 7	2:30-4 p.m.	Mark Thacker

- ⑤ **Introduction to PC E-Mail and Discussion Groups** - This course covers the basics of using electronic mail facilities on the PC to communicate with others on the Internet and BITNET. Accessing USENET Newsgroups via Trumpet will also be covered. **Prior experience using Pegasus Mail is required.**

A two and one-half-hour session, held in the Academic Computing Conference Room (ISB 235):

Date	Time	Instructor
Thursday, July 14	1:30-4 p.m.	Eriq Neale

- ⑥ **Introduction to Internet Tools and Techniques on the Mac** - This course covers Internet tools and techniques that are unique to the Macintosh environment. **Prior experience using a Macintosh is required.**

A one and one-half-hour session, held in the Science Library (ACS General Access Lab, ISB 110):

Date	Time	Instructor
Wednesday, July 13	2:30-4 p.m.	Sean McMains

Microcomputer Courses

- ① **Introduction to Macintosh for Students** - This course is recommended for students who want to learn about Apple Macintosh computers.

A three-hour session, held in the Science Library (ACS General Access Lab, ISB 110):

Date	Time	Instructor
Wednesday, August 3	1-4 p.m.	Sean McMains

- ② **Introduction to WordPerfect 5.1 (DOS)** - Anyone who wishes to use a word processing system to produce class papers and projects is encouraged to take this course. **Prior knowledge of basic DOS commands is required.**

A three-hour session, held in the Chilton General Access Lab (Chilton 255):

Date	Time	Instructor
Monday, July 18	2-5 p.m.	Sean McMains

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- ③ **Introduction to Pegasus Mail** - This course is recommended for people, especially faculty and staff, who want to learn about using Pegasus Mail (Pmail) to communicate with others on campus and via the Internet.

A three-hour session, held in the Chilton General Access Lab (Chilton 255):

Date	Time	Instructor
Wednesday, July 6	2-5 p.m.	Mike Murdock

- ④ **Don't Get Stoned: Computer Viruses and You** - This course is recommended for anyone who uses a microcomputer and wants to protect their software and data against viral infections.

A two-hour session, held in the Academic Computing Conference Room (ISB 235):

Date	Time	Instructor
Monday, August 8	2-4 p.m.	Eriq Neale

- ⑤ **Introduction to Windows 3.1** - This course provides an introduction to the Windows 3.1 operating environment. Emphasis will be placed on using the mouse, control panel, and file manager.

A three-hour session, held in the Chilton General Access Lab (Chilton 255):

Date	Time	Instructor
Monday, August 1	1-4 p.m.	Sean McMains

- ⑥ **Introduction to WordPerfect Presentations (DOS)** - An introduction to the WordPerfect DOS Presentations Product, formerly DrawPerfect. Students will create an organization chart, bullet chart and a data chart.

A three-hour session, held in the Chilton General Access Lab (Chilton 255):

Date	Time	Instructor
Tuesday, August 2	2-5 p.m.	Sandy Burke

- ⑦ **Introduction to WordPerfect 6.0 for Windows** - An introductory course for those migrating to WordPerfect 6.0 for Windows from WP 5.1 for DOS. Items covered will include the Windows environment, using the Power Bar, Button Bar, and Ruler Bar; on-line help and coaches; using Tables, including calculations; using Templates and Styles; working with Graphics; and document manager.

A three-hour session, held in the Chilton General Access Lab (Chilton 255):

Date	Time	Instructor
Thursday, July 21	2-5 p.m.	Sandy Burke

WP User's Group 1994 Summer Schedule

The WordPerfect User's Group is open to any interested student, faculty, or staff member who wishes to share information or address questions about WordPerfect products supported by the Computing Center. All WP User's Group meetings continue to be held on Fridays in Chilton 255. The meetings this summer will be:

° June 17, 3-4 p.m.

° July 15, 3-4 p.m. ■

Computing Courses Offered Through the Personnel Office

The schedule for faculty/staff computing courses offered through the Personnel Office is listed below. Anyone wishing to take a course should contact Personnel at 565-4246 or go to Marquis 128 to pick up a registration form. Registration forms will also be in the back of the monthly *Personnel Newsletter*. All courses will be taught in the Chilton 255 computer lab.

- ☐ **Introduction to Micros & DOS** — July 5, 2-5p.m.
- ☐ **Introduction to WordPerfect 5.1** — June 7, 2-5 p.m.
- ☐ **Introduction to Windows 3.0** — June 16, 2-5 p.m., July 12, 2-5 p.m.
- ☐ **WordPerfect Office 3.1: E-Mail/Calendar** — June 14, 2-5 p.m.
- ☐ **Introduction to WordPerfect 6.0/DOS** — June 23, 2-5 p.m., July 28, 2-5 p.m.
- ☐ **Introduction to WordPerfect 6.0/Windows** — June 28, 2-5 p.m.
- ☐ **Novell User Commands** — June 2, 2-4 p.m., July 7, 2-4 p.m., August 11, 2-4 p.m. ■

LOOK!

Customized Short Courses Available

Faculty members can request "customized" short courses for their classes. Contact ACS to request a course (565-2324, ISB 119). ■



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- ② It is a step towards the 3-D Gopher interface mentioned earlier. The product show runs on a Macintosh, but the proposed extensions can be implemented on any Gopher client that can display GIF images. Developers are encouraged to contact Alan Steremberg for additional code and assistance in porting these items to Gopher clients. I expect that we will hear more about this extension, most likely from the UMN Gopher team.

Developer's Forum

The UMN team also had an open forum for discussion of technical Gopher items. Several questions were answered and some solutions proposed. One important factor was that the UMN team wants to get the Gopher+ protocol specification into the Internet Engineering Task Force standards track within a few weeks. This means that some minor modifications would be made to the protocol, but any major revisions would have to wait.

Most of the discussion centered on how to make Gopher easier for users to use. Some proposals included including more information with each Gopher item to tell the user what type of terminal might be expected to use a particular service, how long to keep the item in memory before the client considers the information to be "old," how to explicitly include parentage of an item so that you can always tell what menu item something came from and other issues related to the Gopher protocol. One thing was apparent though, Gopher+ compatible clients are still the best way of browsing Gopherspace. Currently, no WWW clients (NCSA Mosaic, Lynx) support the Gopher+ extensions, but all Gopher clients currently distributed at UNT do.

Gopher Gateways

Several interesting gateways were discussed that may impact people and enhance Gopherspace for individuals all across the Internet. Below is a synopsis of the information presented.

- **Gopher to SQL** — Structured Query Language is an industry standard for sending queries to database systems such as Oracle, Sybase, dBase and others. This gateway, written by Paul Linder of UMN allows a Gopher users to conduct queries against these databases through Gopher. The best part is that the user composes queries using a simple form fill-in method. All Gopher+ clients are capable of displaying electronic forms in which the user simply fills in fields of information he/she wants to find. The Gopher to SQL gateway then takes this form and composes a SQL query that is then sent to the database system. Results are then translated back to the user as Gopher menu. This menu can contain other electronic forms or search results. Since all results are returned as normal text files, the user can then view them within the Gopher client or manipulate them however they want. All without having to know SQL!
- Since many university and company databases are in SQL, this gateway can be very useful. The only requirements are that the database (or at least a portion of it) must reside on a UNIX system and that a version of the Perl programming language exist for that database system. I will be looking into this for UNT where appropriate.
- **Gopher to Z39.50 1992** — The Z39.50 1992 standard database query language is currently used by a variety of on-line card catalog systems. The data kept in a Z39.50 system can be a variety of things and is not limited to bibliographic info. The database language also supports client-server operations so that you do not have to actually log in to a remote catalog system to conduct your queries. The

Gopher to Z39.50 gateway allows you to conduct your search using nice, pretty, Gopher electronic forms. For example, if you select a database, you will get a form back that asks you for which author, call number or title you are looking for. You don't have to worry about learning a new on-line catalog system or even what machine the database is located on; simply fill in the blanks on the form to conduct your search.

The gateway returns the results of your search as a file that you can then save, print, mail, or do whatever you want to with. The only restriction is that your gateway must be on a UNIX system. I will look into using this here at UNT if there is sufficient demand for it. (Librarians out there, speak up!!!)

- **Gopher to X.500** — The University of Minnesota has an X.500 server with over 100,000 entries in it to keep track of all of their faculty, staff and students. The X.500 server acts as a phone book of sorts, keeping track of the person's E-mail address, personal data, and organizational data. The Gopher to X.500 gateway allows people at UMN to perform searches for other people and modify their own information through normal Gopher+ clients without having to learn specific X.500 clients.

This is somewhat similar to the CSO phone book that a lot of us use here at UNT, but it is different in that the X.500 database contains more information, is designed to hold large amounts of information, and (through this gateway) supports direct user manipulation of the data without having to log in to some host machine. That is, if you want to change your listed phone number or such, you simply choose to do so and the Gopher+ client will ask you for a User-ID and password. Once these are verified, you can search and modify information using very simple fill-in electronic forms. The X.500 service is slowly catching on as a standard way of doing directory

General Information

services (the entire University of Texas system will be moving towards this) and products like this make the transition easier.

Consolidated World Wide Web and Gopher Servers

Michael Potter of Los Alamos National Laboratory developed a WWW server that takes advantage of the existing structure of a Gopher server to make a WWW server. The menu items appear as regular WWW hypertext links, but the administrator can add descriptions of these items to appear next to them. Each menu item can have its own unique graphic and every submenu has its own description page complete with optional graphics at the top of the document.

Depending upon the completeness of this particular server, UNT may be using it soon as our WWW server. The best part is that all of the regular submission methods and information management principles used in a Gopher server are the same for a WWW server, when using this product. My initial testing showed some problems, but I expect those to be corrected by the time that you read this.

Conclusions

While this article may seem long, there were many, many, conference sessions that I was unable to attend, and many that were too technical for this article. Many people contributed great ideas and are working towards bettering the future of Gopher, and the Internet in general.

The most useful thing for me to do at this conference was to meet with other people who are running Gopher and WWW servers to discuss administrative and technical items. Much work will be generated from this conference; work on indexing the Internet (a huge task by itself), improving Veronica services, setting up WWW servers and generally contributing to the well-being of the Internet, and thus to you and others here at UNT. ■

CLIP TIP

Anonymous FTP*

FTP (File Transfer Protocol) can be initiated from your PC or from a host. There is a special User-ID for FTP users who don't have a regular User-ID on the host to or from which they wish to transfer files. This User-ID is not available on all hosts. If a host supports this special User-ID, the host is said to support "Anonymous FTP."

You can FTP from one Internet site to another. On the UNT campus, FTP is supported by the VAX, Sol, Jove, and CMS. You can also use FTP from your PC or Mac in certain situations (contact ACS at 565-2324 if you have questions about this).

To FTP to an "anonymous FTP site," you would type: **ftp remote IP Address**. The IP address will look something like: **FTP.unt.edu** or **129.120.1.1** (this is the Anonymous FTP account on Sol). When prompted for a username you would type: **anonymous**. When prompted for a password you would type your User-ID (**me@unt.edu** for example). You can now use the **dir** command to see a directory listing, the **cd** command to change directories, and the **get filename** command to transfer files (remember to type **binary** before transferring binary files). You can type **help** if you have questions about FTP commands.

** This Clip Tip originally appeared in the May 1992 issue of Benchmarks (v. 13, no. 4). The following references were used for this tip. (1) The Academic Computing Services (ACS) document "Using CUTCP Telnet/FTP," pp. 11-12. This document is available from the Computing Center (ISB 119). (2) The article "TCP/IP for VM" from the October 1991 issue of Benchmarks (Vol. 12 No. 8 pp. 14-16). ■*

General Access Lab Changes

BA 330 and 332 have been closed for the summer; BA 334 and 335 will be open instead. BA 330 and 332 will return as General Access Labs in the fall.

Terrill Hall has moved from room 247 to 220, in the process acquiring more space and computers. Wil Clark, who helps manage labs for the College of Arts and Sciences, has this to say about the new Terrill lab:

The increase in size definitely makes the room more comfortable. We added four 486/66's with 17" SVGA monitors and three MAC Quadra 650s with 17" inch monitors and CD-ROM Drives. A fourth Quadra is on the way. We offer typical GAL software on the machines, but there are a few additional statistics packages. We have not developed a CD-ROM library but students may use their personal CDs on the MACs. We do require use of headphones, supplied by the student, when using multimedia with sound or audio CDs in the lab.

So to recap, the College of Arts and Science Terrill Hall General Access Computer Lab offers: 486 50Mhz or 66Mhz PCs with 15" or 17" SVGA monitors, and 5 1/4" and 3 1/2" high density drives, MAC Quadra 650s with 17" monitors, SuperDrives, CD-ROM drives, and Postscript laser and dot-matrix printers. All students are welcome to use the lab. ■

Computing Center Short Course Registration Form

Please complete this form and return it **AS SOON AS POSSIBLE** if you wish to attend any of the short courses listed below. You may also register on-line via Gopher or over the phone by calling (817) 565-2324.

NAME: _____

FACULTY ____ STAFF ____ STUDENT ____

DEPT: _____

UNDERGRADUATE ____ GRADUATE ____

PHONE: _____

MAILING ADDRESS: _____

SSN: _____

USER-ID: _____

✓	Course	Date	Time	Location
	Introduction to JCL	Monday, June 13	2-4 p.m.	ISB 235
	Introduction to CMS	Tuesday, June 14	2-4 p.m.	ISB 110
	Introduction to CMS	Monday, July 11	2-4 p.m.	Chilton 255
	Introduction to SPSS	Wednesday, June 15	1-4 p.m.	ISB 110
	Introduction to SPSS	Wednesday, July 20	1-4 p.m.	ISB 110
	Introduction to UNIX for VAX Users	Thursday, June 16	2-4 p.m.	ISB 110
	Introduction to UNIX for VAX Users	Tuesday, July 26	2-4 p.m.	Chilton 255
	Introduction to SAS	Monday, June 20	2-4 p.m.	ISB 235
	Introduction to SAS	Thursday, July 21	1-3 p.m.	ISB 235
	Introduction to SAS: CMS, DOS & UNIX	Tuesday, June 21	2-4 p.m.	Chilton 255
	Introduction to SAS: CMS, DOS & UNIX	Monday, July 25	2-4 p.m.	Chilton 255
	Introduction to UNIX	Wednesday, June 22	2-4 p.m.	Chilton 255
	Introduction to UNIX	Tuesday, July 19	2-4 p.m.	Chilton 255
	Introduction to SAS: Windows, OS/2 & X-Window	Thursday, June 23	2-4 p.m.	ISB 110
	Introduction to SAS: Windows, OS/2 & X-Window	Wednesday, July 27	2-4 p.m.	ISB 110
	Introduction to SPSS PC+	Monday, June 27	2-4 p.m.	ISB 110
	Introduction to SPSS PC+	Thursday, July 28	2-4 p.m.	ISB 110
	Introduction to E-Mail & More on CMS	Tuesday, June 28	2-4 p.m.	ISB 235
	Introduction to SPSS on Windows	Wednesday, June 29	2-4 p.m.	Chilton 255
	Introduction to SPSS on Windows	Thursday, August 4	1-3 p.m.	Chilton 255
	Introduction to E-Mail & More on UNIX	Thursday, June 30	2-4 p.m.	ISB 110
	Introduction to Internet Tools & Techniques	Tuesday, July 5	2:30-4 p.m.	ISB 235
	Introduction to Pegasus Mail	Wednesday, July 6	2-5 p.m.	Chilton 255
	Introduction to Gopher	Thursday, July 7	2:30-4 p.m.	ISB 235
	Introduction to Internet Tools & Techniques on the Mac	Wednesday, July 13	2:30-4 p.m.	ISB 110
	Introduction to PC E-Mail & Discussion Groups	Thursday, July 14	1:30-4 p.m.	ISB 235
	Introduction to WordPerfect 5.1 (DOS)	Monday, July 18	2-5 p.m.	Chilton 255
	Introduction to WordPerfect 6.0 for Windows	Thursday, July 21	2-5 p.m.	Chilton 255
	Introduction to Windows 3.1	Monday, August 1	1-4 p.m.	Chilton 255
	Introduction to WordPerfect Presentations (DOS)	Tuesday, August 2	2-5 p.m.	Chilton 255

✓	Course	Date	Time	Location
	Introduction to Macintosh for Students	Wednesday, August 3	1-4 p.m.	ISB 110
	Don't Get Stoned: Computer Viruses and You	Monday, August 8	2-4 p.m.	ISB 235

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